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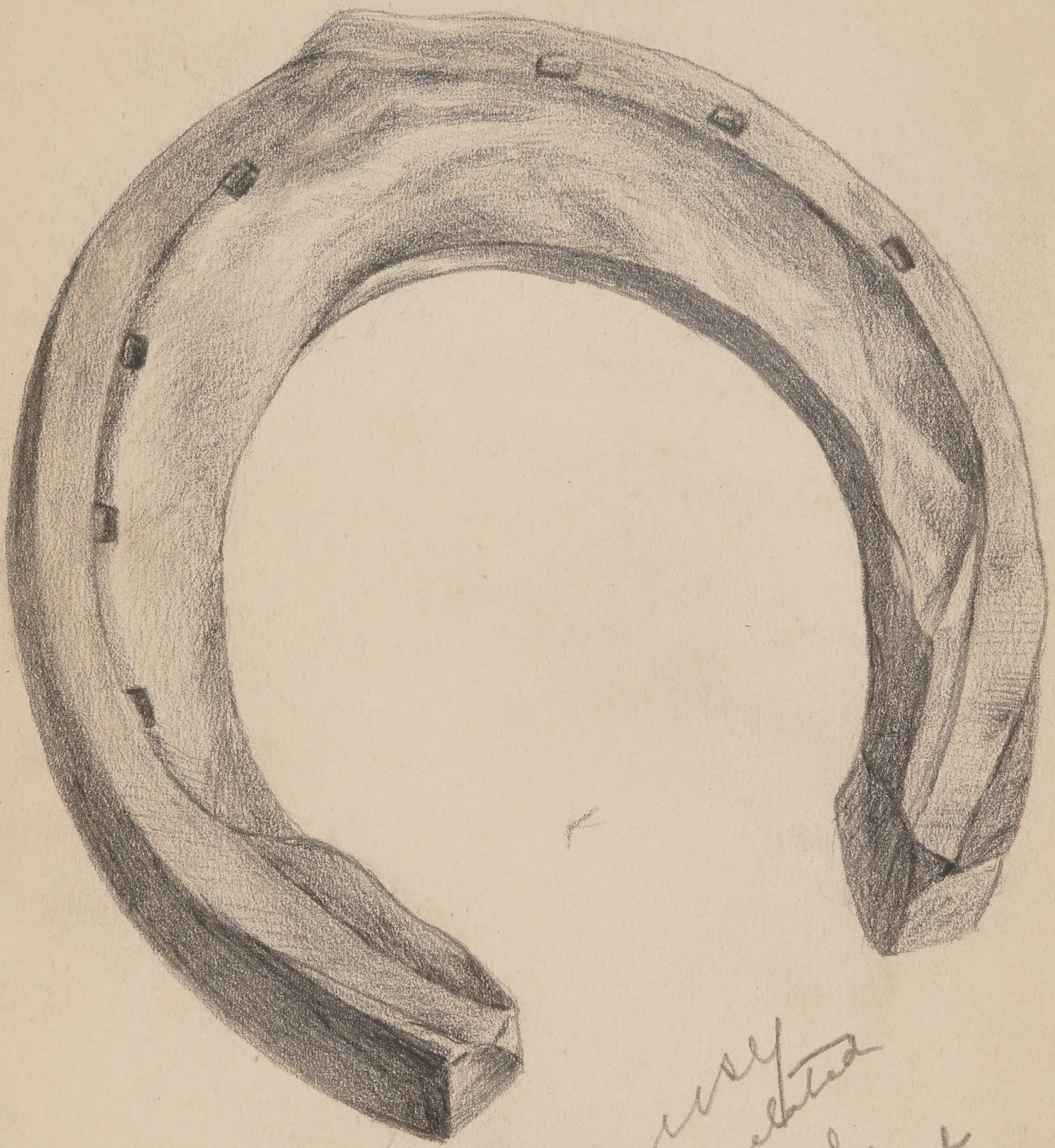

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THE

HORSE'S FOOT,

AND

HOW TO KEEP IT SOUND,

With Illustrations.

By WILLIAM MILES, Esq.

SIXTH EDITION WITH AN APPENDIX

ON SHOEING IN GENERAL AND HUNTERS IN PARTICULAR.

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CONTENTS.

	Page
Description of the foot - - - - -	3
The horny crust - - - - - -	,,
The sole - - - - - - -	5
The frog - - - - - - -	,,
The bones of the foot - - - - -	7
The lateral cartilages - - - - -	9
The sensitive sole - - - - - -	,,
The sensitive frog - - - - - -	10
The elastic cushion or fatty frog - - - -	,,
The coffin joint - - - - - -	,,
The navicular joint - - - - -	,,
The natural form of the foot - - - -	11
Removing the old shoe - - - - -	12
Preparation of the foot for receiving a new shoe - -	,,
Rasping the crust - - - - - -	,,
Paring the foot - - - - - -	13
Reasons for varying the paring out of feet at different seasons	,,
Different feet require different treatment - - -	14
General directions for paring the foot - - -	,,
"Opening out the heels" condemned - - -	15
Reasons for *never allowing a knife to approach the frog* -	,,
Weight of the shoe - - - - -	18
Width of the web - - - - - -	,,
Objections to shoes "well set off at the heels" - -	19
The effect of such shoes upon the navicular joint - -	20
The foot does not receive its form from the shoe - -	21

	Page
The situation of the nails determines the form of the foot -	22
The form of the shoe - - - - -	„
Objections to thick heeled shoes - - - -	23
The toe turned up out of the line of wear - - -	„
Steel at the toe objectionable - - - -	„
A clip at the toe desirable - - - - -	„
The shoe should not be too short - - - -	24
A flat surface for the crust to bear upon - - -	„
The nail holes in the flat surface, and not partly in it and partly in the seating - - - -	„
The seating - - - - - -	„
The ground surface - - - - -	„
No *objection* to the application of a hot shoe to the foot to ascertain its bearings - - - -	25
Reasons for removing the shoes every two or three weeks	„
Number and situation of the nails - - -	26
More nails than are necessary *not merely useless* - -	28
Five nails employed,—but six recommended - -	„
Reasons for recommending six nails - - -	29
How expansion of the foot is permitted by one sided nailing	30
Corns cured by one sided nailing with five nails - -	31
Evidence of a commercial traveller in favour of one sided nailing with five nails only - - - - -	„
Remarks upon shoeing with leather - - - -	33
The hind shoe considered - - - - - -	34
Objections to the general use of "Calkins" - - -	35
Clips - - - - - - - - -	„
The cause and prevention of "forging" - - -	36
"Overreach" how produced and how prevented - -	37
A plan for detecting the exact part of the shoe with which a horse "cuts" - - - - - -	„

PAGE

Reasons against shoeing horses in the stable, away from the forge - - - - - - - - 38

General observations upon shoeing hunters, and plating race horses - - - - - - - 40

The situation of the nails a common cause of horses losing their races - - - - - - - 41

The effect of the loss of one inch upon each stride in running over the Derby course - - - - ,,

The advantages of a loose box - - - - 43

The disadvantages of stalls shewn in the number of horses cast by cavalry regiments - - - - 45

The objections commonly urged against loose boxes - 46

The best mode of converting stalls into loose boxes - 47

The *real*—but *unurged*—objection to loose boxes - - 48

Horses having always been kept in stalls,—no argument against its being hurtful to them - - - 49

New form of muzzle recommended, instead of the two objectionable forms in common use - - - 50

Meaning of the word "sound," as applied to horses' feet - ,,

A foot afflicted with inflammation and pain—not sound - 51

"Pointing"—not merely a trick—but a symptom of unsoundness - - - - - - - ,,

Perfectly sound feet among horses in work—very rare,—and not absolutely essential;—nevertheless very desirable - - - - - - 53

The importance of regular daily exercise to the soundness of horses' feet - - - - - ,,

Treatment of the foot in the stable - - - 55

A useful hoof ointment - - - - - 56

The best mode of applying moisture - - - ,,

Morning the fittest time for the application of cold water to the feet - - - - - - ,,

PAGE

Stopping the feet at night recommended - - - 57
Cow dung a good stopping - - - - „
No fear of *producing* thrushes by moist stopping - - „
Bad shoeing the real cause of thrushes - - - „
Two cases of thrushes cured by standing on wet sawdust without shoes - - - - - „
Standing on wet sawdust in a loose box preferred to turning out - - - - - - 58
Value of a general warranty considered - - - „

APPENDIX.

The argument, that horses require more support at the heels than nature has given to them, refuted - - 2
Reasons, why the system of one sided nailing has not obtained more general use - - - - 3
Extra fastenings only required to counteract defective fitting of the shoe - - - - 4
Undue weight attached to the opinion of smiths and stable people - - - - - - 5
Estimate of the value of a smith's opinion upon the foot of the horse - - - - - 6
Frequent repetition of the same thing in the same way, not *experience* - - - - - 7
Horse-masters invited to acquaint themselves with the principles of shoeing - - - - „
Smiths and grooms, for the most part, ready and willing to receive instruction - - - - - 8
Knowledge of the anatomy of the foot not absolutely essential to a practical acquaintance with the art of shoeing - - - - - - „

PAGE

Six nails sufficient for hunters in any country - - 10

A mechanical impossibility, that any description of ground shall pull off a shoe, which has been *properly fitted to the foot* - - - - - - „

Smiths, for the most part, desirous of information, but disheartened by the indifference of their employers - 12

Case of three horses worked through the summer with five nails, one of them hunted with six, and then with five, followed by a second with five - - - 13

Case of a horse, which used to work in nine nails and two clips, hunted with six nails and one clip - - „

Description of the hunting shoe - - - - „

Case of ploughing with five nails - - - - 14

Case of hunting with five nails - - - - „

Case of horses working in the Falmouth mail with five nails 15

A horse shod in leather with four nails - - - 16

Five other horses shod with four nails - - - „

Shoes weighing twenty two ounces and a half retained for five weeks by four nails - - - - „

Case of ploughing with four nails - - - - „

Leaders of the Falmouth mail shod with four nails - „

Four horses shod with *three* nails only - - - 17

Reasons, which have deterred Veterinary Surgeons and others from experimenting upon few nails - - 18

The great value of one-sided nailing to hunters - 19

A detailed description of the process of shoeing - - 20

The causes of shoes being "cast" considered - - 29

LIST OF PLATES.

PLATE

1. The ground surface, and side view of the hoof.
2. The detached bones,—and section of the foot.
3. The upper and under surfaces of a shoe.
4. A foot with a shoe "well set off at the heels."
5. The same foot, shod upon the right principle.
6. A very bad shoe, brought into comparison with a good one.
7. Another view of the same two shoes.
8. A plan, for converting a four stalled stable into three loose boxes.
9. A muzzle, to prevent horses eating their beds.
10. The section of an old foot compared with that of a young one;—and a view of the interior of the hoof.

—o—

APPENDIX.

FIGURE

1. The natural form of the foot.
2. A heel of a shoe "in the rough."
3. Ditto ..... ditto after it has been "cut off."
4. Ditto ..... ditto completed.
5. The tongs recommended for turning up the toe of the shoe.
6. The foot surface of the heel of a shoe.
7. A shoe of the usual form.
8. A shoe of the form of the foot.
9. The usual mode of shoeing with leather.
10. An improved mode of shoeing with leather.
11. Shews the difference between a good and bad form of nail.
12. Exhibits the effect of wear upon the security of a nail.

PREFACE.

I HAVE been induced, at the solicitation of several friends, who have deplored to me their total want of anything like useful, or practical knowledge upon the subject of shoeing, to embody for their guidance some rough notes which I had made upon soundness of the horse's foot in general, and on shoeing in particular. In offering them to the public, I beg to premise that I have not the smallest intention of what is called writing a book,—least of all a scientific book. My sole object is to communicate, in the most familiar language the subject will admit of, the result of several years' observation, and of much tedious experiment, undertaken with a view of ascertaining what mode of shoeing, system of stabling, and quantity of exercise, promised the fairest prospect of preserving the foot of the horse in soundness and comfort to himself, and usefulness to his owner for the longest period.

I disclaim all pretension to any new discovery in the art of shoeing;—amateurs' discoveries are, for the most part, of small value. I have preferred unscrupulously availing myself of the labours of professional and practical men,—by carefully examining their systems—trying their plans—and ultimately adopting that

which appeared the best calculated to ensure success. If, in what follows, I am accused of entering too minutely into matters of detail, my answer must be, that I write exclusively for the information of the uninformed, including those who are unwilling, as well as those who are incompetent to wade through the various elaborate and conflicting treatises, already published upon the horse's foot, and who are of necessity compelled to yield implicitly in all such matters to the *experience* of others,—whose *experience* will generally be found to resolve itself into *untiring perseverance in one unvaried plan for a series of years.*

My aim has been, by keeping out of view every thing not essential, and presenting only those things that are practical, to render a hitherto difficult and little understood subject, familiar and easy. If I have in any degree succeeded, I shall feel myself amply repaid for whatever pains it may have cost me.

I have drawn the illustrations upon the stone myself, thinking it more desirable to secure accuracy of detail, than to risk the loss of it for the doubtful advantage of finer drawing. I must not close this short Preface without acknowledging my obligations to Messrs. Rogers, for the ready assistance they have invariably afforded me, in carrying out my plans, as also for the unrestrained use of their forge, which with the services of their smiths, they kindly placed at my command.

DIXFIELD, EXETER.

November 14*th*, 1845.

THE HORSE'S FOOT.

&c.

In describing the various parts which compose the horse's foot, it shall be my endeavour to avoid, as much as possible, all minute anatomical details and scientific technical terms, and to confine myself to a plain description of those parts only, a general knowledge of which is essential to the full understanding of what is right, and what wrong, in the formation and application of the horse's shoe.

The hoof is divided into horny crust or wall, sole, and frog.

The horny crust is secreted by the numerous blood vessels of that soft protruding band, which encircles the upper edge of the hoof, immediately beneath the termination of the hair; and is divided into toe, quarters, heels, and bars.* Its texture is insensible, but elastic throughout its whole extent; and, yielding to the weight of the horse, allows the horny sole to descend, whereby much inconvenient concussion to the internal parts of the foot is avoided. But if a large portion of the circumference of the foot be fettered by iron and nails, it is obvious that that portion at least, cannot expand, as before, and the beautiful and efficient apparatus, for effecting this necessary elasticity, being no longer allowed to act, by reason of these restraints, becomes

* Plate 1.

altered in structure; and the continued operation of the same causes, in the end, circumscribes the elasticity to those parts alone, where no nails have been driven; giving rise to a train of consequences destructive to the soundness of the foot, and fatal to the usefulness of the horse.

The toe of the fore foot is the thickest and strongest portion of the hoof, and is in consequence less expansive than any other part, and therefore better calculated to resist the effect of the nails and shoe. The thickness of the horn gradually diminishes towards the quarters and heels, particularly on the inner side of the foot, whereby the power of yielding, and expanding to the weight of the horse is proportionably increased, clearly indicating that those parts cannot be nailed to an unyielding bar of iron, without a most mischievous interference with the natural functions of the foot. In the hind foot, the greatest thickness of horn will be found at the quarters and heels, and not as in the fore foot, at the toe. This difference in the thickness of horn is beautifully adapted to the inequality of the weight which each has to sustain —the force with which it is applied—and the portions of the hoof upon which it falls. The toe of the fore foot encounters the combined force and weight of the fore hand and body, and consequently in a state of nature is exposed to considerable wear and tear, and calls for greater strength and substance of horn, than is needed by any portion of the hind foot, where the duty of supporting the hinder parts alone is distributed over the quarters and heels of both sides of the foot.

The bars are continuations of the wall, reflected at the heels towards the centre of the foot, where they meet in a point, leaving a triangular space between them for the frog.

The whole inner surface of the horny crust, from the centre of the toe to the point where the bars meet, is everywhere lined with innumerable, narrow, thin, and projecting horny plates,* which extend in a slanting direction from the upper edge of the wall to the line of junction between it and the sole, and possess great elasticity. These projecting plates are the means of greatly extending the surface of attachment of the hoof to the coffin bone, which is likewise covered by a similar arrangement of projecting plates, but of a highly vascular and sensitive character; and these, dovetailing with the horny projections above named, constitute an union combining strength and elasticity in a wonderful degree.

The horny sole covers the whole inferior surface of the foot excepting the frog. In a well formed foot it presents an arched appearance and possesses considerable elasticity, by virtue of which it ascends and descends, as the weight above is either suddenly removed from it, or forcibly applied to it. This descending property of the sole calls for our especial consideration in directing the form of the shoe; for, if the shoe be so formed, that the horny sole rests upon it, it cannot descend lower; and the sensible sole above, becoming squeezed between the edges of the coffin bone and the horn, produces inflammation, and perhaps abscess. The effect of this squeezing of the sensible sole is most commonly witnessed at the angle of the inner heel, where the descending heel of the coffin bone, forcibly pressing the vascular sole upon the horny sole, ruptures a small blood vessel, and produces what is called a corn, but which is, in fact, a bruise.

The horny frog occupies the greater part of the triangular

* Plate 1, fig. 2.

space between the bars, and extends from the hindermost part of the foot to the centre of the sole, just over the point where the bars meet; but is united to them only at their upper edge: the sides remain unattached and separate, and form the channels called the "Commissures." *

The frog is evidently designed for very important uses; but, as our object is purely practical, and not speculative, we will not stop to inquire, whether its chief office is to expand the foot, and prevent contraction or not—which is debatable ground—but proceed to consider it in a point of view bearing more usefully on our subject, viz.—as the part which offers us the best criterion, whereby to judge of the effect of our shoeing upon the foot generally; for no part undergoes so much change from bad shoeing, or exhibits it so soon, as the frog. If we carefully observe the form and size of the frog in the foot of a colt of from four to five years old, at its first shoeing, and then note the changes which it undergoes as the shoeings are repeated, we shall soon be convinced, that a visible departure from a state of health and nature is taking place; at first it will be found large and full, with considerable elasticity; the cleft oval in form, open, and expanding, with a continuous, well defined, and somewhat elevated boundary; the bulbs at the heels fully developed, plump, and rounded; and the whole mass occupying about one-sixth of the circumference of the foot. † By degrees the fulness and elasticity will be observed to have diminished; the bulbs at the heels will shrink, and lose their plumpness; the cleft will become narrower, its oval form disappear; the back part of its boundary give way; and it will dwindle into a narrow crack, extended back between

* Plate 1, fig. 1. † Plate 1, fig. 1.

the wasted, or perhaps obliterated bulbs, presenting only the miserable remains of a frog, such as may be seen in the feet of most horses, long accustomed to be shod.

The bones proper to the foot are three in number, viz.—the coffin bone, the navicular bone, and part of the coronet bone: they are contained within the hoof, and combine to form the coffin joint; * but the smallest of them, the navicular bone, is of far more importance as connected with our subject of shoeing, than either of the others; for upon the healthy condition of this bone, and the joint formed between it and the tendon, which passes under it to the coffin bone, and is called the navicular joint, mainly depends the usefulness of the horse to man.

This small bone,† which in a horse sixteen hands high measures only two and a quarter inches in its longer diameter, three fourths of an inch at the widest part of its shorter diameter, and half an inch in thickness in the centre, its thickest part, has the upper and under surfaces, and part of one of the sides overlaid with a thin coating of gristle, and covered by a delicate secreting membrane, very liable upon the slightest injury to become inflamed; it is unfortunately so placed in the foot, as to be continually exposed to danger; being situated across the hoof, behind the coffin bone, and immediately under the coronet bone;‡ whereby it is compelled to receive nearly the whole weight of the horse each time that the opposite foot is raised from the ground.

The coffin bone‖ consists of a body and wings; and is fitted into the hoof, which it closely resembles in form. Its texture is particularly light and spongy, arising from the quantity of canals or tubes, that traverse its substance in every direction,

* Plate 2, fig. 4. † Plate 2, fig. 3. ‡ Plate 2, fig. 4. ‖ Plate 2, fig. 2.

affording to numerous blood vessels and nerves a safe passage to the sensitive and vascular parts, surrounding it; while the unyielding nature of the bone effectually protects them from compression or injury under every variety of movement of the horse.

In an unshod foot the front and sides of the coffin bone are deeply furrowed, and roughened, to secure the firmer attachment of the vascular membranous structure, by which the bone is clothed; but in the bone of a foot that has been frequently shod, this appearance is greatly changed, the furrows and roughness giving place to a comparatively smooth surface. This change I imagine to be produced by the shoe limiting, if not destroying, the expansive power of that part of the horn, to which it is nailed; whereby a change of structure in the membrane itself, as well as absorption of the attaching portions of the bone, is induced; for it is an invariable law of the animal economy not to continue to unemployed structures the same measure of efficient reparation, that is extended to parts constantly engaged in performing their allotted tasks. The shoe restricts or prevents expansion; while Nature, as the secret influence is called, immediately sets to work to simplify the apparatus for producing the expansion, which art has thus rendered impracticable, and substitutes for it a new structure, less finely organized, but admirably suited to the altered condition of the parts.

The wings extend from the body of the bone directly backward, and support the "lateral cartilages" of the foot.

If a coffin bone be placed upon a flat surface, it will be seen, that the whole of the front of the toe is considerably raised or arched, as if a notch had been cut out of it, giving it almost the

appearance of an imperfect bone.* I consider this to be one of the numerous provisions of nature for diminishing the concussion, to which the horse's foot is so constantly exposed; for if the toe of the bone corresponded exactly with the toe of the hoof, a shock would be communicated to the whole foot each time it struck against a stone or other projecting substance; whereas this intervening space, by breaking the connection of the parts, almost entirely prevents the transmission of the jar. This conjecture is greatly strengthened by the fact, that the coffin bone of the hind foot, where the jar would be less felt, presents no such deficiency at the toe.

The coronet bone is nearly square;† its breadth from side to side exceeds its height by about one fifth; it is situated partly within, and partly without the hoof,‡ it supports the pastern bone, and rests upon the coffin, and navicular bones.

The lateral cartilages are attached to the upper edge of the wings of the coffin bone, and project backwards beyond the bone, giving form and substance to the heel. About half of each rises above the hoof as high as the pastern joint, and can be distinctly felt under the skin.

The sensitive covering of the coffin bone, is a prolongation of the coronary substance: it is firmly attached to the surface of the bone, and is collected into numerous little plaits or folds, which run in parallel slanting lines down its sides.

The sensitive sole, or as it is sometimes called, the fleshy sole, is about the eighth of an inch thick, and is almost entirely made up of blood vessels and nerves; it is one of the most vascular and sensitive parts of the body, and is attached to

* Plate 2, fig. 2. † Plate 2, fig. 1. ‡ Plate 2, fig. 4.

the lower edge of the sensitive covering of the coffin bone,—to the bars,—and point of the frog,—and also with great firmness to the whole of the arched under surface of the coffin bone.

The sensitive frog includes not only the part corresponding to the sensitive sole, but also the peculiar spongy elastic substance, which intervenes between it and the navicular joint, and fills the space between the cartilages. The proper sensitive frog is thicker, and less finely organized, than the sensitive sole, possessing fewer blood vessels and nerves.

The coffin joint is formed by portions of the three bones of the foot, meeting together within the hoof;* and is furnished with all the parts necessary to constitute a perfect joint. It is rarely, if ever, the original seat of disease.

The navicular joint,†—the least injury to which entails such disastrous consequences,—is merely a sort of false joint, or bag, formed between the under surface of the navicular bone, and the upper surface of the tendon of the muscle, whose office it is to bend the foot, by acting upon the coffin bone. It is situated beneath, and somewhat behind the coffin joint, and is lined throughout by a delicate secreting membrane, for the supply of the fluid necessary to the even sliding of the tendon over the bone, after the manner of a pulley. Any diminution in the quantity of fluid, either from inflammation of the membrane, or other cause, must produce friction of the sides of the bag upon each other, and lay the foundation for that train of fatal effects which must ensue under such circumstances, to a part so constantly, and vigorously employed, as the navicular joint;—viz. first,—inflammation of the membrane,—then ulceration and absorption of the gristle,—and

* Plate 2, fig. 4. † Plate 2, fig. 4.

lastly, disease of the bone itself—a speck of which, no larger than a pin's head, produces lameness that defies all the powers of man to cure, and dooms the horse to a life of pain and misery, for the remainder of his days.

Before treating of the preparation of the foot for the reception of a shoe, it is desirable to correct the generally received, but erroneous opinion, that the shape of a perfect foot is circular, or very nearly so. It is this opinion that leads the generality of smiths to direct their energies towards reducing the foot to that shape as soon as possible; indeed so impatient are some persons to commence this work of setting nature right, that they cause their colts' feet to be "*put in order*,"—as the mischievous interference is called,—long before the process of "breaking" has rendered the evil of shoeing necessary. There are very few things so little varied in nature as the form of the *ground surface* of horses' feet; for whether the hoof be high heeled and upright,—or low heeled and flat,—large or small,—broad or narrow,—the identical form of ground surface is maintained in each, so long as it is left entirely to nature's guidance. The outer quarter, back to the heel, is curved considerably and abruptly outwards, while the inner quarter is carried back in a gradual and easy curve.*—The advantage of this form is so obvious, that it is matter for wonder it should ever be interfered with. The enlarged outer quarter, extends the base and increases the hold of the foot upon the ground; while the straighter inner quarter, lessens the risk of striking the foot against the opposite leg.

It should surely be our object to retain these valuable

* Plate 1, fig. 1.

qualities as long as we can, and not lightly sacrifice either of them to a false notion of what may be considered a prettier form. Whenever we observe nature steadily persevering in one form, or one plan ; depend upon it, it is not within the range of man's ingenuity to amend it ; and he will better serve his own interest in accommodating his views to her laws, than in attempting to oppose them. In this spirit let us proceed with our subject.

Before the foot can be prepared for receiving a new shoe, it will be necessary to remove the old one ; in doing which great care should be taken to raise all the clenches,* and every approach to violently wrenching it off should be scrupulously avoided ; dragging the nails with their turned down ends through the crust, not only inflicts pain upon the horse by their pressure on the sensitive parts within the hoof,—as is evinced by his flinching and struggling to free his foot from the grasp of the smith,—but separates the fibres of the horn beyond what is necessary, and interferes with the future nail hold. If the shoe resist a moderate effort to displace it, one or two of the nails, that appear to retain it the most, should be partly punched out : by this small trouble much future inconvenience will be saved ; the enlargement of the nail holes prevented, and the crust left in a firmer and sounder state to nail to.

The foot being relieved of the shoe, should have the edges of the crust well rasped : to do this effectually requires a degree of force calculated to arouse the fears of the uninformed, and to make them suspect something like wanton destruction of the hoof. It is however only removing those parts, which in the unshod foot would have been worn away by contact with the

* Plate 1, fig. 2

ground. The practice is further beneficial in detecting any stubs, that may chance to have been left in the nail holes.

The operation of paring out the foot is a matter requiring both skill and judgment; and is moreover a work of some labour, when properly performed. It will be found that the operator errs much oftener by removing *too little*, than *too much;* at least it is so with the parts that ought to be removed, which are sometimes almost as hard and unyielding as a flint stone, and in their most favourable state, require considerable exertion to cut through: the frog, on the other hand offers so little resistance to the knife, and presents such an even, smooth, clean looking surface when cut through, that it requires more philosophy than falls to the share of most smiths, to resist the temptation to slice it away, despite a knowledge, that it would be far wiser to leave it alone.

It would be impossible to frame any rule applicable to the paring out of all horses feet, or indeed to the feet of the same horse at all times: for instance, it is manifestly unwise to pare the sole as thin in a hot dry season, when the roads are broken up, and strewed with loose stones, as in a moderately wet one, when they are well bound and even; for in the former case the sole is in perpetual danger of being bruised by violent contact with the loose stones, and consequently needs a thicker layer of horn for its protection; while the latter case offers the most favourable surface that most of our horses ever have to travel upon, and should be taken advantage of for a thorough paring out of the sole, in order that the internal parts of the foot may derive the full benefit, arising from an elastic and descending sole; a state of things very essential to the due performance of their

separate functions. Again—in horses with upright feet and high heels horn grows very abundantly especially towards the toe; and such are always benefitted by having the toe shortened,—the heels lowered,—and the sole well pared out; while in horses with flat feet and low heels horn grows sparingly; and the toe of such feet, being always weak, will admit of very little shortening. Such heels being already too low should scarcely be touched with the rasp; and the sole presents such a small quantity of dead horn, that the knife should be used with great discretion.

In the first case the thickness of the sole prevents the due descent of the coffin bone, when the horse's weight is thrown upon the foot; and it requires in consequence to be pared down thinner and rendered more yielding; while in the latter case it is already so thin and unresisting, that it can with difficulty support the coffin bone in its proper place, and offers at best but a feeble resistance to its downward tendency.

The consideration of the foregoing circumstances will shew the impracticability of prescribing general directions, capable of meeting the exigences of all feet, and the futility of attempting to establish one particular mode of paring out all feet; one particular mode of applying the shoes; or one particular form of shoe. They must, each in its turn, be varied to meet the degree of deviation from what may be called a perfect foot. Perfect feet or indeed tolerably well formed feet, with a fair growth of horn, should have the toe shortened, the heels lowered, and the sole well pared out; that is, all the dead horn removed, and, if need be, some of the living too, until it will yield, in some small degree, to hard pressure from the thumb.

The corners formed by the junction of the crust and bars

should be well pared out, particularly on the inside; for this is the common seat of corn, and any accumulation of horn in this situation must increase the risk of bruising the sensible sole between the inner point or heel of the coffin bone and the horny sole. I very much doubt either the utility or wisdom of leaving the bars projecting beyond the surface of the sole; it cannot possibly increase the power of resisting contraction, and this projecting rim is left exposed to the danger of being broken and bruised by contact with stones and other hard substances; and it is further attended with the disadvantage of making the cleaning out of these corners a work of considerable ingenuity with so unwieldy an instrument as a common drawing knife. I prefer paring them down to a level with the sole, or very nearly so; avoiding however every approach to what is called, "opening out the heels," a most reprehensible practice, which means cutting away the sides of the bars, so as to show an apparent increase of width between the heels, which may for the time deceive the eye; but it is a mere illusion, purchased at the expense of impaired power of resistance in the bars, and ultimate contraction of the feet. It is self evident, that the removing any portion from the sides of the bars must diminish their substance, and render them weaker, and consequently less able to resist contraction.

If it were not for the unaccountable prejudice in favour of carving the frog into shape at every shoeing, I should have had very little to say about it in this place: my only direction, as a general rule, would have been, *to leave it alone and never allow a knife to approach it:* but this far spread prejudice renders it necessary for me to explain, why the knife must be so entirely

withheld from the frog, while its liberal application to the other parts of the foot is shewn to be so beneficial to them. First then, the frog has naturally less power of producing horn than any other part of the foot; and the effect of shoeing seems to be, still further to diminish this power by obstructing the expansion of the hoof, and thereby exposing the membrane which secretes the horn, to undue pressure: indeed in the generality of feet it would appear almost to check the growth of the frog altogether; for if we compare the size of the frog with the circumference of the foot in a horse long accustomed to be shod, we shall find the space occupied by it will not exceed one tenth, or one twelfth of the whole circumference: whereas in the natural and unshod foot it occupies about one sixth. Now this dwindling down to one half its proper size is the direct effect of shoeing and paring; but I believe that much the larger portion of the mischief is attributable to the unnecessary evil of paring, rather than the necessary one of shoeing. The reason assigned for further mutilating this fast diminishing organ at every shoeing is a most unfounded dread, that it would run all over the foot, if it were not for the controlling influence of the drawing knife: and so general is this belief, that it is entertained more or less by almost every smith, notwithstanding the daily, nay hourly, evidence that is presented to his senses of the gradual but certain diminution of the frogs of nearly all the horses which he shoes. I have horses in my possession, whose frogs have not been touched by a knife for five years, and yet it has never occurred to any one, that they are overgrown; but every one is attracted by the evenness of surface and fine expanded cleft, which they present. Perhaps about one in a thousand may form an exception; where a large

loose-textured frog may require a little paring once or twice in a year. The layer of horn that covers the frog, is thinner in substance, and more delicate in texture than that of any other part of the foot, and, when once destroyed, is very imperfectly and sparingly reproduced. The first stroke of the knife removes this thin horny covering altogether, and lays bare an under surface, totally unfitted from its moist, soft texture, for exposure either to the hard ground or the action of the air; and in consequence of such unnatural exposure it soon becomes dry and shrinks: then follow cracks:—the edges of which turning outwards form rags:—these rags are removed by the smith at the next shoeing; whereby another such surface is exposed, and another foundation laid for other rags; and so on, until at last, the protruding plump elastic cushion, interposed by nature between the navicular joint and the ground, and so essential to its preservation from injury, is converted by the mischievous interference of art, into the dry, shrunk, unyielding apology for a frog, to be seen in the foot of almost every horse, that has been regularly shod for a few years. The frog is provided within itself with two very efficient modes of throwing off any superfluous horn it may be troubled with; and it is very unwise in man to interfere with them: the first and most common is the separation from its surface of small bran like scales, which becoming dry fall off in a kind of whitish scurf, not unlike the dust that adheres to Turkey figs. The other which is upon a larger scale, and of rarer occurrence, is sometimes called "casting the frog." A thick layer of frog separates itself in a body, and shells off—to the full as deep as a usual paring with the knife: but it is worthy of remark, that there is this very important

My experience has been that a frog left alone often sheds twice a year. F.G.

difference between the two operations: nature never removes the horny covering, until she has provided another horny covering beneath, so that although a large portion of the frog may have been removed, there still remains a perfect frog behind, smaller it is true, but covered with horn and in every way fitted to sustain exposure: while the knife on the contrary removes the horny covering, but is unable to substitute any other in its stead. My advice therefore is to leave the frog to itself—nature will remove the superfluous horn, and the rags can do no harm, and, if unmolested, will soon disappear altogether.*

In describing the form of the shoe, and explaining its details, I shall not hesitate to repeat any thing which I may have said before, if it should appear to me that by so doing, I can render myself more intelligible. The first recommendation I have to offer concerning the shoe itself has reference, not to its form, but to its weight; and is suggested by the prevailing idea, that shoes cannot well be *too light*. A very little reflection will convince us, that this notion must be founded in error, involving as it does two most objectionable properties in a shoe, viz. liability to bend, and insufficient covering.—The inconvenience to a horse of an ounce or so of increased weight in each shoe is not worth a moment's consideration, compared with the discomfort to him of travelling upon a hard road with a bent shoe on his foot, straining the nails, and making unequal and painful pressure.

The other evil, arising out of light shoes, is a deficiency of width in the web,* which robs the foot of much valuable protection, and leaves the sole and frog exposed to numberless injuries, that a wider web would effectually prevent.

* Plate 3, fig. 2.

For my own horses I not only have the web made wider than is usually met with, but I take especial care that the same width of web is continued throughout the whole shoe, back to the heels, giving increased covering and protection to the sole of the foot. The common practice is to get it narrower and narrower, until it dwindles at the heels into about half its original width ;* and the only reason assigned for this injurious practice is, "liking to see the shoe well set off at the heels."†

I know that I have a very prevalent and deep-rooted prejudice to contend with in this matter; still I do not despair of convincing some, at least, of my readers that it is both unphilosophical and detrimental; it imposes upon the understanding by deceiving the eye, and is in the last degree hurtful to the horse's foot. When a shoe is thus set off at the heels, it imparts to the foot an appearance of greater width than it really possesses; but if the shoe happened to be made of glass, or some other transparent substance, the deception would be at once detected; for then the *outer* edge of the foot would be seen to rest on the *inner* edge *only* of the shoe,‡ and the whole of the remaining width of the web would be seen projecting beyond the hoof; forming a convenient clip for another horse to tread upon, but utterly useless as affording support to any part of the foot itself. A common observer, on taking up a foot with a shoe so fitted, looks only to the space between the heels of the shoe; and if he find *that* to be considerable, he does not stop to inquire, what quantity of the foot is exposed by the opening, but seeing what he calls "a good open foot," is satisfied, forgetting altogether that his

* Plate 7, fig. 1. † Plate 4, fig. 1. ‡ Plate 4, fig. 2.

inspection never extended to the foot at all, but was confined exclusively to the shoe.

Having shewn in what manner this practice is unphilosophical, I will turn to the consideration of it as pernicious, it being one of the commonest causes of a horse falling suddenly lame, or dropping as if he had been shot—two phrases unluckily in much too common use to require explanation here.

No portion of the foot needs protection from our hard stony roads like those, which are comprised in the space between the heels ; for just in front of the cleft of the frog, immediately over the centre of that space, lies the navicular joint,* which, it must be remembered, is compelled to sustain nearly the whole weight of the horse, alternately with that of the other foot at every movement he makes ; and is moreover the seat of nine tenths of the chronic lameness, to which he is liable. We must also remember, that this joint is formed by the navicular bone and the tendon, which passes under it ; and we can readily imagine that its delicate membranes, being jammed against their own bone by the weight of the horse and his rider on the one hand, and a stone resting upon a hard road on the other hand, must receive a most painful and distressing squeeze : but if, as is too often the case, these membranes chance to be in a state of inflammation, our wonder may well cease that the poor animal should drop, as if he had been shot ; for more exquisite torture it is not possible to inflict upon him.

Again if we take the weight of the horse at half a ton, and that of his rider at eleven stone, and propel the combined weights with the whole muscular power of the animal against a

* Plate 1. fig. 1.

firmly fixed stone, it would call for no great stretch of imagination to conceive, that the collision might sometimes fracture so small a bone, as the navicular bone, and produce instant and incurable lameness. These things do happen; and it is to obviate *them*, and the intermediate train of smaller evils, that I always employ a tolerably wide webbed shoe, and bring in the heels of it almost close to the frog, so as to reduce the opening between the heels as much as I conveniently can: and, if in fitting the shoe, I observe a corner pressing upon, or in any way interfering with the frog, I cause it to be cut off, rather than have the shoe opened out to let in the frog; for in opening out the shoe, a portion equal to the objectionable corner must be thrust out beyond the hoof, which is very undesirable, as presenting a ready hold for stiff ground to pull the shoe off by. This plan of bringing in the heels, while it covers and protects the angles whence the bars are reflected,* at the same time draws the sides of the shoe nearer together, and opposes to the stony road, a surface of iron instead of the unprotected foot, warding off thereby many a blow, that would otherwise prove highly injurious.

There is a notion very generally entertained, that the foot receives its form from the shoe—an inference, I take it, drawn from the feet of Chinese ladies,—but totally unsupported by any thing, which happens to the foot of the horse: still it does exist, and I have no doubt tends in a greater degree to keep up the prejudice in favour of open heeled shoes. The truth really is, that the shape of the shoe cannot by possibility influence the shape of the foot; for the foot, being elastic, expands to the weight of the

* Plate 5, fig. 2.

horse in precisely the same degree, whether it be resting upon the most open, or the most contracted shoe: it is the *situation of the nails*, and not the shape of the shoe, that determines the form of the foot; and whether the shoe be wide, or narrow, if the heels and quarters of both sides be nailed to it, the foot will inevitably become smaller and smaller, and the heels more and more contracted. The most open shoe will avail no more than the narrowest. If the nails, on the contrary, be placed in the outside quarter and toe, leaving the heels and quarters of the inside, which are the most expansive portions, free,* no shape that we can give to the shoe can of itself change the form of the foot; for, supposing the shoe to be too contracted, the foot will expand out over it, provided it be not restrained by the too backward placing of the nails. I would not however be understood to mean, that the shape of the shoe is therefore of no importance; for I trust, I have already proved the contrary, whilst considering the mischievous tendency of that form, which is "well set off at the heels;" inviting, as it were, with open arms every hard substance in the road, "to come and do its worst;" as though the numerous ills the foot is unavoidably exposed to, and which no ingenuity can avert, were not sufficiently distressing to the horse, or vexatious in their consequences to its owner. Seeing then that the shape of the foot is in no way changed by the form of the shoe, both wisdom and interest would prompt us to adopt that form, which possesses the greatest number of advantages, with the fewest disadvantages; and such a form it shall now be my endeavour to describe in detail. The shoe must, as we have seen, possess substance enough to prevent its bending, and width

* Plate 5, fig. 1.

of web enough to ensure protection to the foot ;—the thickness, like the width of web, should continue precisely the same from toe to heel,* and not, as is generally the case, increase as it proceeds backwards, until at the heels it becomes fully doubled.† This is a great evil for many reasons, and among others, that it throws the horse forward upon the toe, and causes him to strike it against every projection, which comes in its way. Now, as horses are quite sufficiently prone to do this without the assistance of high heeled shoes, it should be our business to obviate it as much as possible; and I find this is best accomplished by keeping the heels of an even thickness with the rest of the shoe, and turning up the toe out of the line of wear,‡ thereby imparting to the toe of a new shoe when placed upon a flat surface, the same elevation from the ground line as that of an old one.

In doing this we only carry out in the shoe, what nature has already done in the foot; she has arched the toe of the coffin bone,‖ to diminish the effect of a jar at the toe; and we do the same to the shoe, to lessen the cause of the jar—the common practice is just the reverse of this; it welds a lump of steel into the toe, which not only increases its thickness, and the number of obstacles that it necessarily encounters, but, being of a harder texture, is longer wearing down, and consequently exposes the foot to the greatest amount of concussion. Supposing a horse to wear his shoes so hard, that they will not last a month,—much beyond which, as the foot will outgrow them, they had better not last,—then steel the toe; but still let it be turned up as much out of the line of wear as possible. A small clip at the point of the toe§ is very desirable as preventing displacement of the shoe

* Plate 6, fig. 2. † Plate 6, fig. 1. ‡ Plate 1, fig. 2. ‖ Plate 2, fig. 2.
§ Plate 3, fig. 1.

backward; it need not be driven up hard; it is merely required as a check or stay. The shoe should be sufficiently long, fully to support the angles at the heels,* and not, as is too often the case, so short, that a little wear imbeds the edge of it in the horn at these parts.† The foot surface of the shoe should always have a good flat even space left all around for the crust to bear upon ;‡ for it must be remembered, that the crust sustains the whole weight of the horse, and needs to have a perfectly even bearing everywhere around the shoe. In this space the nail holes should be punched,‖ and not, as is too often the case, partly in *it*, and partly in the seating.§ In what is technically called "back holing the shoe," which means completing the opening of the nail holes on the foot surface, great care should be taken to give them an outward direction, so as to allow the points of the nails to be brought out low down in the crust. The remainder of the foot surface should be carefully seated out, particularly around the elevated toe,¶ where it might otherwise press inconveniently upon the sole; and I would have the seating carried on fairly to the point where the crust and the bars meet, in order that there may be no pressure in the seat of corns: the chance of pressure in this situation will be further diminished by bevelling off the inner edge of the heels with a rasp.

The ground surface should be perfectly flat, with a fullering or groove running round the outer edge, just under the plain surface, whereon the crust bears.** The principal use of the fuller is to receive the heads of the nails, that secure the shoe, and prevent their bending or breaking off:—it is further useful

* Plate 7, fig. 2. † Plate 7, fig. 1. ‡ Plate 3, fig. 1. ‖ Plate 7, fig. 2.
§ Plate 7, fig. 1. ¶ Plate 3, fig. 1. ** Plate 3, fig. 2.

in increasing the hold of the shoe upon the ground, and with this view I always have it carried back to the heels.

The danger apprehended from the shoe being applied to the foot so hot as to burn the crust, and cause it to smoke, is utterly groundless. I would not have it made to burn itself into its place upon the foot, without the assistance of rasp or drawing knife, but I would have it tried to the foot sufficiently hot, to scorch every part that bears unevenly upon it; because the advantage of detecting such projecting portions is very great, and this mode of accomplishing it, is positively harmless. Indeed it is the only one, by which the even bearing necessary to a perfect fitting of the shoe can be insured.

No shoe should ever be nailed to the foot, until it has been ascertained that the pressure of the hands is sufficient to keep it steadily in its place, and preclude any appearance of day light between it and the foot; for, if the shoe does not accurately correspond to the surface of the foot, but is disposed to shift about upon it, the nails will be exposed to a constant strain in order to keep it in its place; whereas they should merely have to hold it to the foot, and not as it were, to keep it there by force.

The shoes should not be permitted to remain on the horse's feet more than two or three weeks without removal; for in that time, the heads of the nails will have become worn, and, from fitting the holes less perfectly than before, will admit of a trifling motion of the shoe upon the nails; whereby the holes in the hoof will be enlarged, and the security of the shoe endangered. Another reason for removing the shoes, is the opportunity which it affords of paring away those portions of horn, which in a state of nature would have been worn down by contact with the ground

The next circumstance to be considered is one of vital importance to our subject, as upon it depends the amount of disturbance that the natural functions of the foot are destined to sustain from the shoe; viz. the number and situation of the nails, which are to secure it to the foot. If they be numerous, and placed back in the quarters and heels, no form of shoe, be it ever so perfect, can save the foot from contraction, and navicular disease. If on the contrary they be few, and placed in the outside quarter, and toe, leaving the inside quarter and heels quite free to expand, no form of shoe is so bad, that it can, from defective form alone, produce contraction of the foot.

Three years ago, I commenced a series of experiments upon shoeing, with a view, among other things, of ascertaining how *few* nails are absolutely necessary, under ordinary circumstances, for retaining a shoe securely in its place. The subjects of my experiments were six horses of my own, and three belonging to friends; the nine among them representing very fairly the different classes of pleasure horses; not indeed including hunters or race horses, each of which require a separate and totally different treatment; but carriage horses, ladies' horses, and roadsters; and they also included the common variations in form and texture of the generality of horses' feet.

When my attention was first directed to the subject of nailing, I was employing seven nails in each fore, and eight in each hind shoe. I then withdrew one nail from each shoe, thus reducing the number to six in the fore, and seven in the hind shoes; and finding at the end of a year, that the shoes of all the horses had been as firmly retained as formerly, I withdrew another nail from each shoe, leaving only five in the fore shoes, and six in the

hind. I found however that six nails would not retain the hind shoe of a carriage horse, without allowing it sometimes to shift: so I returned to seven in the hind shoes, and have continued to employ that number ever since: but five have retained all the fore shoes as firmly during the whole of the last year and a half, as six had previously done.

I have invariably directed and superintended the whole operation of shoeing during these experiments; and have always been very careful to mark, that the nails were not driven high up in the crust, but brought out as soon as possible; and that they were very lightly driven up, before the clenches were turned down; and not, as is generally the case, forced up with all the power that the smith can bring to bear upon them with his hammer. I mention these circumstances to show that my object really was to ascertain *how little* would retain a shoe, and to what extent the foot might be relieved from the evil of unnecessary restraint; a matter sometimes of great moment, and at all times desirable.

The clenches should not be rasped away too fine, but turned down broad and firm. The practice of rasping the whole surface of the hoof after the clenches have been turned down, should never be permitted; it destroys the covering provided by nature as a protection against the too rapid evaporation of the moisture of the hoof, and causes the horn to become dry and brittle.

Two of the horses, alluded to above, worked for some time with only four nails in their fore shoes.

I have detailed these experiments with a view to expose the groundless nature of the fear, that expects to cast a shoe at every step, unless it be held to the foot by eight or nine nails, driven

high into the crust. If the presence of a nail in the crust were a matter of no moment, and two or three more than are necessary were *merely useless*, there would be no great reason to interfere with this practice of making "assurance double sure;" but it is far otherwise;—the nails separate the fibres of the horn, and they never by any chance become united again, but continue asunder and unclosed, until by degrees they grow down with the rest of the hoof, and are ultimately after repeated shoeings removed by the knife.

If the clenches should happen to rise, they must be replaced without delay; as such rising imparts to the nails a freedom of motion, which is sure to enlarge the size of the holes; and this mischief is often increased by the violent wrenching which the shoe undergoes from side to side in the process of removal by the smith.

Now as these holes cannot possibly grow down, and be removed under three shoeings, it will be found that even with seven nails, the crust must always have twenty-one of these separations existing in it at the same time; and as they are often from a variety of causes extended into each other, they necessarily keep it in a brittle unhealthy state, and materially interfere with the security of the future nail hold. Unluckily the common practice under such circumstances is to increase the number of nails, with the view of ensuring the security of the shoe, while on the contrary it increases the evil. My object is to shew that these shaky places, as they are called, may be relieved by the omission of one or two of the nails, without endangering the security of the shoe. Suppose the number employed to be seven,—to gain such an end they might be safely reduced to five,—which is the largest

number I have employed for more than two years; and until I discover some good reason for increasing it, it is the largest I intend to employ: but I am far from advising the general adoption of this number; for if from imperfect fitting of the shoe, misplacement of the nails, neglect of removing in proper time, or from any other cause, the horse should chance to cast a shoe, the whole blame would be attributed to the five nails; and the poor beast in all probability be doomed to eight or nine for the remainder of his life. I do however very strongly advise the adoption of six, knowing them to be fully sufficient for retaining the shoes of all pleasure horses under all circumstances, except perhaps hunters. Since the foregoing was published, Colonel Luttrell, master of the Somersetshire fox hounds, has informed me that the horse, which he rode most frequently last season, was shod with six nails only—not one of which, in consequence of his cutting a good deal, was placed in the inner quarter, and that he experienced no inconvenience whatever from the plan. If I had entertained the smallest doubt about their efficiency, it would have been entirely removed on the arrival of the thirteenth Light Dragoons last year in Exeter; for among the horses of that regiment, I found, through the kindness of Lieut. Colonel Brunton, who allowed me to inspect the shoeing, the strongest possible confirmation of the truth of my position; here were horses with every variety of feet shod with six nails only, and these all placed in the outside limb and toe of the shoe, all the remainder of the shoe remaining free and unattached to the foot. Mr. Legrew, the very intelligent veterinary surgeon of the regiment, informed me that he had not employed more than six nails for nearly two years, and that the loss of a shoe was a very rare occurrence with

them, even on a field day, than which there is scarcely any work more trying to the security of horses' shoes: any mode of fastening, that has proved itself equal to retaining the shoes through a long field day, in stiff ground, may very safely be recommended as fully sufficient for all ordinary purposes.

The question of the efficiency of six nails for road work is settled, I should think, to the satisfaction of the most sceptical, by the fact of the thirteenth having done the Queen's escort duty during their year at Hounslow without the loss of a single shoe. Any one acquainted with the rapid pace, at which Her Majesty invariably travels on the road, will readily admit the sufficiency of the test.

During the last six months I have arranged my five nails upon "this system of one sided nailing," recommended and first practiced by Mr. James Turner; and the result has been most satisfactory—the shoes have not only been firmly, but *easily* held to the feet, as is evidenced by the clenches not having risen in one single instance, a clear proof that the struggle between the expansion of the foot and the resistance of the shoe is entirely overcome by this mode of fastening. A further experience of twelve months since the publication of the first edition has fully confirmed the above conclusions in every particular. This very desirable end appears to be attained in the following manner,—the outer side of the foot, being the only part nailed to the shoe, carries the whole shoe with it at every expansion;—while the inner side, being unattached, expands independently of it;—whereby all strain upon the nails is avoided, and the foot is left, with respect to its power of expansion, as nearly as possible in a state of nature.

An unexpected benefit has arisen to one of my horses from this plan, in the total disappearance of two very troublesome corns :—they had existed in his feet for ten years, during seven of which I tried every plan that I had ever heard of, as likely to effect a cure,—both in form of shoe and local application ;—without however any decided advantage : but the adoption of this plan of fastening the shoe to the foot, by removing all restraint and pressure from the part, has accidentally achieved that, which I had so long sought in vain.

Since writing the above, I learned that a commercial traveller, who was detained in Exeter on account of an accident,—had for some time past employed only five nails, placed in the outer limb and toe of his horse's fore shoes. Upon hearing which I made a point of seeing him ; and he informed me,—that he always performed his journeys on horseback,—that they averaged full five thousand miles a year, and that his comfort necessarily depended very much upon the freedom of action and safe going of his horse :—that about fourteen weeks ago he found him stepping short, and going tenderly, and consulted a veterinary surgeon about it, who advised his being shod with five nails only upon the one sided plan of nailing, asserting at the same time, that he had recommended and employed that plan very extensively with most beneficial results.—It was accordingly tried, and he very soon had the gratification of feeling his horse move under him with a firm and confident step, most unlike that to which he had lately been accustomed.—He told me, that further experience had only confirmed his first impression ; and that he should continue to shoe upon the same system with the same number of nails ; that the first pair of shoes set at rest all his doubts and fears

about the insecurity of the plan; for he had occasion to ride his horse in the new shoes thirty miles a day for the first six days in succession; and that they were as firmly attached to the feet at the end of the one hundred and eighty miles, as they were at the commencement of the journey; and that they continued firm, until the horse was re-shod, which did not happen for five weeks. He also told me, that he has found five nails retain a shoe with leather between it and the foot, for an equally long period. I have likewise myself tested their capability of holding a shoe with leather under it, having shod a horse in that manner for the last two months; and although I have not permitted the shoe to remain on for five weeks without removal, I have satisfied myself that they are fully equal to retaining the shoe, as long as it ought to remain on.

The horse in question is as unfavourable a subject for the experiment, as could have been selected, being twenty years old, with large flat brittle feet and high action. He is moreover of a nervous temperament, and occasionally knocks his feet about very much: I have nevertheless continued to shoe him in leather during the twelve months, which have elapsed since the publication of the foregoing, and the result has shown the plan to have been eminently successful: the character of the horn has changed from brittle and shaky to firm and tough, and affords secure nail hold in every part.—His shoes (which were removed three weeks ago) are now entirely worn out, and I thought it might prove interesting to those, who like myself wish to know *how little* will retain a shoe, when it has once been accurately fitted to the foot, if I recorded the particulars of the examination which I made of them this morning.—I found them securely held to the feet, and

the clenches unmoved:—not one of the five nails, which constituted the only fastening of either of the fore shoes, had penetrated quite an inch up the crust, before it was brought out, and clenched down; and the last on the inside, which was five inches and three quarters from the heel, barely extended three quarters of an inch up the crust.—Lighter fastening than this cannot be conceived, and I take it, could only succeed, where the horn has become solid, and the shoe has been fitted with great care.—The smallest uneven bearing of the crust upon the shoe, or the least projection of the shoe beyond the hoof at the quarters or sides of the heels would to a certainty endanger its security.

I may here remark, that the habit of encumbering the sole and frog with a *thick* layer of tow, between them and the leather, is very objectionable:—it causes unnecessary heat and pressure, and should for these reasons be avoided. The principal object of tow is to block up the openings, through which gravel and dirt would otherwise insinuate themselves between the leather and the foot; its presence should therefore be confined to the cleft of the frog,—the commissures,—and the angles between the heels and the bars. These parts should be filled to a level with the body of the frog so as to enable them to share the pressure with it; but none should be permitted to rest upon the frog itself.—The long straggling ends should be collected together, and spread over the sole—the ends of one side being made to overlap those of the other.—By this plan they will become fixed in the tar and grease, with which the foot ought previously to have been liberally dressed, and will materially assist in overcoming the tendency that the tow has to work itself out.

Much of the inconvenience supposed to arise from shoeing

with leather, is caused by the injudicious placement of the tow. I believe that many horses derive great comfort from having leather inserted between the foot and the shoe; particularly when the surface of the roads is broken up, and strewed with loose stones. Its use is sometimes objected to on the ground that it rots the frog:—but this is altogether a mistake:—what appears to be decayed frog, is nothing more than an accumulation of the natural exfoliation of horn, which the presence of the leather has not allowed to escape.

In the first edition I omitted to say any thing about the treatment of the hind foot, because I considered it of less importance than that of the fore foot; but as I was repeatedly assured that a few general remarks upon it would not prove altogether unacceptable, I availed myself of the first opportunity, that offered, of appending them.

The hind foot certainly does not demand the same measure of attention as the fore foot, in as much as its position in the horse and the nature of its office render it less liable to injury, and consequently less frequently lame:—it is however by no means entirely exempt, nor does it always escape disease of its navicular joint; for I have myself found disease in a navicular bone taken from a hind foot:—this being the case then we should endeavour to guard against it by interfering as little as possible with its expansive power; and that will be best done by keeping the nails on the inside as far removed from the heel as we conveniently can, to which end I recommend the employment of seven nails only,—four to be placed in the outer and three in the inner side of the shoe.—The holes in the inner side are to be punched closer together, and kept more towards the toe than those

on the outside, which need to be more spread out, as affording greater security of hold to the foot.—The shoe should be carefully fitted to the hoof all round, particularly at the heels, which are too commonly left without any support whatever;—and the mischievous custom of turning down the outer heel only must be avoided, because it throws the weight entirely upon the inner quarter, which is the part the least able to bear it, and causes much uncomfortable strain to the fetlock joint above.—Calkins, even though they may be turned down of perfectly even lengths on each side, which however is very rarely done, are objectionable appendages, and had better be dispensed with, excepting perhaps for very heavy draft, when their ends by entering the ground may prevent the foot from slipping backward, and may thus enable the toe to obtain a firmer hold. For carriage and riding horses I much prefer to have the shoe, for the last two inches made gradually thicker towards the ground surface, the last inch being plane with the ground, and I believe that such a form often prevents strains of the back sinews, when a horse is suddenly stopped with his hind feet far under him, or when he has to hold back a carriage against a steep hill.

The toe being the part of the hind shoe, which is exposed to the greatest wear, requires to have considerable substance given to it, and should always be accompanied by a strong narrow clip turned up in front of the hoof, to obviate the danger of the shoe being forced back upon the foot, a circumstance very likely to happen, where a clip is not employed. Clips on the side of the foot are of very doubtful advantage in retaining the shoe, and are decidedly objectionable, as occupying the place of nails, which would perform the duty much more efficiently, and inflict less

injury upon the horn. The common objection urged against a clip at the toe, viz. that it causes the unpleasant noise called "forging," arises from the abuse rather than the use of it; for if we consider for a moment, how "forging" is occasioned, we shall see that a stout narrow clip, properly let into the horn at the toe, is not at all likely to produce it, although a broad clumsy one, extending from side to side of the toe, occasionally may.

Before a horse can advance his fore foot, he must disengage it from the ground;—to effect this he is obliged to raise it in a direction inclining upwards and backwards, and, if he happen to dwell in the performance of this preliminary movement, the hind foot, which is propelled forwards and downwards, to be deposited beyond the spot, that was the moment before occupied by the fore foot,—comes into collision with it,—and forces the toe, clip and all into the hollow of the fore foot turned up ready to receive it. Now in doing this the clip is not brought into immediate contact with iron, but is struck against either sole or frog, as the case may be and cannot produce any very audible sound: the truth is that the offensive noise is caused by the meeting of the edges of the two shoes at the points, where the hind shoe is stopped from entering further into the opening of the fore shoe.

These points of contact are almost always indicated by a bright spot on each side of the rim of the hind shoe, and are generally to be found at the extremities of the toe on either side, just where the shoe begins to turn backwards, and they should be removed by the file:—indeed it is a good plan always to make the front of the toe of the hind shoe to incline backwards, as it approaches the ground, so as to place the ground surface somewhat further back than the foot surface.

There is one other circumstance, connected with the toe of the hind shoe, deserving of notice; I mean that part, with which a horse inflicts upon himself the injury called an "overreach," and which is erroneously supposed to be the *front* of the shoe at the toe, whereas it is invariably caused by the *back* edge of the web at the toe, which in an old shoe becomes as sharp as a knife, and often cuts out a piece from the soft parts immediately above the heel of the fore foot as clean as any knife could have done it.—To avoid this accident, which sometimes produces very great inconvenience, the back edge of the web all around the toe should be filed away, until it presents a blunt rounded surface, which, if it should fail in preventing the overreach altogether, will at least preserve the parts from being wounded.

While treating of the hind shoe, I may perhaps be expected to give some directions for obviating the inconvenient habit which some horses have of "cutting;" but as each individual horse has his own particular mode of doing it, any general rule as applied to the shoe, must of necessity fail to meet the requirements of the great majority of cases. Our first care should be to acquaint ourselves with the exact part of the shoe with which the injury is inflicted:—until this is clearly ascertained we shall be working in the dark, and most probably do a great deal more than is necessary. The plan I have always adopted has been to apply a boot covered with wet pipe-clay to the injured leg, and then to trot the horse some little distance:—the result has been the transfer of a portion of the pipe-clay to the offending part of the opposite shoe, thereby indicating the necessity of its removal.—The small extent, and little suspected situation of such part, is sometimes truly surprising.—I once, in a case of inveterate

cutting, found the pipe-clay adhering to the *outside toe*.—In this case the poor horse had been subjected to shoes of every conceivable shape and deformity, without, of course, any other result than the torture arising from the twisting and straining, consequent upon uneven bearing: — but the moment the offending part was discovered and removed, the cutting ceased:—even bearing was then restored to the foot, and the horse thereby placed in comfort.

Cutting with the fore foot is almost always to be prevented by one sided nailing, and keeping the shoe a little within the edge of the crust on the inner side—but as this is generally overdone, by placing the shoe so much within as to deprive the crust of its requisite support, it will be advisable to ascertain by the use of pipe-clay, the exact point with which the shoe strikes, when the part needing alteration at once discloses itself.

The practice of shoeing horses in the stable, away from the forge, where there is no possibility of correcting any defect in the fitting of the shoe, is so utterly opposed to reason and common sense, that I should only have adverted to it as a custom of by-gone days, exploded with the use of the buttress, and the notion of chest founder, if I had not actually witnessed its perpetration four times within the last year, and that too in the stables of gentlemen, by no means addicted upon other matters, to yield their judgment a ready captive to other men's prejudices. Now if either of these gentlemen had happened to ask the smith "what he was doing?" the answer would in all probability have awakened him to a sudden conviction, that he was giving his countenance to a most unphilosophical proceeding; for the smith would have told him, that he was *fitting a shoe to the horse's*

foot, which the gentleman would at once perceive to be *impossible ;* inasmuch as he had no means at hand, whereby to effect the smallest change in the form of the shoe, however much it might require it ; and the truth would instantly force itself upon him, that the man was fitting the *foot* to the *shoe*, and not, as he supposed, the *shoe* to the *foot*. To fit the *shoe* to the *foot* without the aid of anvil and forge is impossible ; and any one acquainted with the exactness and precision, necessary to a perfect fitting, would not hesitate to declare the attempt to be as absurd, as it is mischievous. Suppose, for example, the shoe to be a little too wide in any particular part ; this will throw the nail holes rather further out than they ought to be ; but as there are no means of altering it, *there* the nails must be driven, and a constant strain outwards will be the inevitable consequence ; if on the contrary it be too narrow, the strain will be inwards, and press upon the sensitive parts of the foot ; in either case producing uneasiness, and causing the horse to move with a feeling, undecided step. Again, if the crust have not an even bearing every-where upon the foot surface of the shoe, the part so deprived of support, being elastic, will be unable to resist the pressure from above, or the outward thrust of the parts within, and yielding to this two-fold force, will drag upon the elastic union between the hoof and the internal parts of the foot at that particular place, and cause great uneasiness ; and this is by no means an unfrequent source of stumbling and broken knees.

Although I do not mean to assert that shoeing at the forge will of itself ensure good fitting, I do assert that it is attended with this great advantage, that, if the smith be inclined to do it

well, it supplies him with the means of indulging his inclination ; whereas in the stable, no quantity of zeal will enable him to do more, than make the best of a bad matter.

The only reason I have ever heard in defence of this practice, is the alleged liability of horses to take cold from exposure to the drafts in a smith's forge. I can only say in answer, that it has never happened to my own ; and I believe that a little care, and some extra clothing would ensure the same exemption for others.

Although it is no part of my plan to enter upon the subject of shoeing hunters, or plating race horses, I may still perhaps be excused for offering a few general observations upon both, before I take leave of the subject of shoeing altogether.

In reference to the hunter, I would advise, as soon as the hunting season is over, and the altered nature of his work will admit of it, that his feet be relieved, as much as possible, by the substitution of longer shoes, with broader web, and fewer fastenings, particularly on the inside ; and that he continue to be so shod, until the return of the hunting season calls again for the hunting shoe. It is too much the custom to consider, that, because a horse happens to be a hunter, he must therefore be shod all the year round in short shoes so firmly fastened to his feet, that the foot itself would be as likely to be pulled off as the shoe.

A far greater difference is made between the shoe of a hunter and the shoe of a hack, than there need be, both in form and fastenings ; and many a valuable horse has been disabled for a whole season, if not ruined for life, because a shoe could not come off, and save the foot and leg from a fearful strain. When the wrench is very violent the shoe had better yield.

With regard to race horses I am confident that a greater number lose their races from the situation and number of the nails employed in plating, than from any other cause whatever, not even excepting the trickery and tampering, sometimes practised, but oftener I believe unjustly suspected.

The dread of casting a plate is so great, that it is no uncommon thing to see them secured by eight or nine nails, extended from heel to heel. Now it is impossible that a hoof so fettered can yield or expand to any force applied to it through the medium of the weight and power of the horse; and it is also certain, that, if the hoof do not expand, the violence with which a race horse lashes the ground at every stride, must needs squeeze the sensitive parts very uncomfortably between the bones of the foot and this unyielding hoof, and deter him in some degree from throwing his whole weight with all his heart *into his feet*, as he does, when he has no apprehension of producing pain thereby. Now let us see what the effect of stepping short, say only *one inch*, upon each stride would be in running over the Derby course, (a mile and a half.)

The estimated stride of a race horse averages twenty four feet; it would therefore require three hundred and thirty such strides to accomplish the proposed distance; and the loss of one inch only upon each stride would give a total loss upon the whole distance of three hundred and thirty inches, or nine yards and six inches, equal to rather more than three lengths of a horse sixteen hands high: but suppose the loss of distance to be four inches upon each stride, which it is much more likely to be; then the loss would be thirty six yards and two feet, or thirteen lengths; fully enough to raise a cry of "foul play" "the horse

is amiss" &c. Now no jockey in the world, however frequently he may have ridden a horse could so exactly measure his stride, as to be enabled to detect a deficiency of *one seventy second* part of it, which four inches would be; much less could he detect the *two hundred and eighty eighth* part of it, which one inch would be; so that he could never make himself acquainted with the real cause of so signal and unexpected a defeat; and the whole matter would remain involved in mystery, casting suspicion and distrust on all around.

How commonly do we hear that a horse performed his last gallop at a much better pace than he ran his race; and what a catalogue of causes are conjured up to account for the falling off in his speed; not one of which in all probability has any thing to do with the matter. It would most likely be found that he had taken his gallop in shoes to which his feet had become accustomed; but he ran his race in new plates firmly nailed from heel to heel "making him quite safe," by putting it out of the range of possibility that he should ever be enabled to "get into his best pace," for there is nothing more certain than the fact, that a horse cannot go his best pace, unless his feet are allowed to expand freely to his weight at every stride. A ready way of permitting this expansion would be the adoption of three quarter plates extending from the outer heel to the commencement of the inner quarter, which would effectually protect those parts most exposed to wear and tear in the generality of horses' feet, viz. from the inner toe across the foot to the outer quarter. Such a plate might be very securely retained by six nails distributed between the outer heel and inner toe, thereby reserving

to the whole inner side of the hoof its uncontrolled power of expansion.

I turn now to the consideration of a subject of fully as much importance to the health and soundness of a horse's foot as good shoeing itself; I mean that inestimable blessing to him *freedom of motion in the stable.* The advantages of a loose box are so little understood by horse-masters in general, that its usefulness is almost entirely limited in their estimation to sickness and disease: and it is no uncommon sight to behold two or three loose boxes untenanted, because forsooth, there are no sick horses in the stud.

I was first led to divide my stable into boxes instead of stalls from motives of compassion for my horse, and a desire to rid myself of the uncomfortable feeling it always produces in me, to see so docile and generous an animal subjected to even greater restraint than a wild beast in a menagerie; for the lion or tiger is permitted freely to traverse his small den, while the poor horse is chained by the head to a fixed point in his still smaller den, a prisoner twice imprisoned, and denied even the poor relief afforded by a change of position. I little thought, while thus solely bent upon ministering to my horse's comfort, how essentially I was furthering my own interest, until an accident brought me acquainted with Mr. James Turner's invaluable treatise on the foot of the horse, where I first learned, what subsequent experience has fully confirmed to me, the wonderful extent, to which the usefulness of the horse is *secured and prolonged* by the freedom of motion obtained in a loose box. We have already seen, how materially his usefulness is impaired by the smallest injury to the navicular joint; and we have also seen

the beautiful provision nature has made for its protection from injury in the elastic cushion, interposed between it, and the horny frog. It shall now be my endeavour to show, in what manner a loose box tends to keep this cushion in a healthy state of elasticity.

Nature forms nothing in vain; all her works are designed for specific purposes; each organ has its separate function assigned to it; and the only condition upon which she will consent to keep it in efficient repair, is the regular and periodical performance of that function. For instance, suppose an accident deprive a man of the use of his arm for a few months; the muscles at the end of that period will be found visibly shrunk, and the whole arm considerably smaller than its companion, constituting in horseman's language "a very bad match." Here the non-employment of the muscles has accelerated the process of absorption, while that of restoration has been nearly suspended. The muscles of the other arm on the contrary, being regularly employed, have earned and received their due measure of restoration, and retain their original dimensions; and so it is with the elastic cushion in the horse's foot; if we deprive the horse of the power of alternately expanding and contracting his foot, as nature intended he should do, this cushion will shrink and lose its elasticity; but if we supply him with the means of doing so, he will avail himself of them; and its elasticity will be retained to a good old age.

The almost perpetual movement of a horse in a state of nature, while grazing, greatly tends to preserve the different elastic parts of his foot, in a sound and healthy condition, by the regular compression and expansion which they undergo,

according as his weight is thrown upon, or removed from them; but if we chain him to a post for twenty-two out of every twenty-four hours, we can scarcely wonder that so unnatural a proceeding should derange an organ, that requires motion to preserve it in health. Take, in illustration of the mischievous tendency of this practice, the horses of a cavalry regiment: they have every thing in favour of sound feet except the *stall* and the *rack chain:* they are entirely exempt from the hard work which is generally referred to as the cause of grogginess; they have no oft repeated, and long journeys to perform at a fast pace on the hard road: their exercise, shoeing, grooming, and feeding, are all administered with clockwork regularity: the litter is carefully removed from under their feet during the day: the veterinary surgeon is always at hand, to attend to the first symptom of lameness: and still there are more horses cast as unserviceable every year from disabilities commencing in the foot, than from all other causes combined. The *rest*, and not the *work*, has wrought the ill. Now let us see, how loose boxes are to prevent these evils. When a horse is free to move, he very rarely remains long in the same place or the same position: he is perpetually turning himself about, either to catch a distant sound, or observe an approaching footstep: every thing attracts him; every thing interests him; and, what is of far greater moment, every thing causes him to *move;* whereby each foot is benefitted to the extent of some four or five expansions and contractions; and the sound of the corn bin at feeding time will produce at least fifty such. It is far otherwise with the poor beast, chained up in a stall; he is attracted by the same sounds; hears the same step approach; and feels

the same interest: he pricks his ears, bends his head, and strains his neck; but alas! he does not move; his feet are not expanded; turning about he knows to be impossible, and therefore he does not attempt it; even the sound of the corn bin, though it excite him to jump and play, will scarcely cause him to expand his feet; the excitement inclines him to rush forward, while the wall forbids him to comply; and he is forced to collect himself, so as to throw his weight upon his hind quarters, almost to the entire exclusion of the fore feet. Horses accustomed to a loose box generally acquire a slow, deliberate movement in it, allowing their weight to dwell evenly and fully upon each fore foot; while those kept in a stall for the most part move in it with a quick, sudden, catching motion, scarcely ever entrusting their whole weight to either foot for more than an instant.

In speaking of the baneful effects of stalls, Mr. Turner says, "I firmly believe, that, if every valuable horse in this kingdom were to be forthwith turned into a large box, night and day, besides the continuance at his ordinary work, it would prove the worst event for veterinary surgeons that has ever happened in the horse world; because it would tend more to cut off our supply of groggy lameness and its attendants, than any circumstance, or single cause that has ever yet been published or even named."

With the expression of my entire concurrence in this opinion, I will proceed to consider the objections commonly urged against loose boxes, which for the most part are so weak, that I cannot conceive their prevailing much longer against such vast advantages: the only serious one is want of space; and that is often pleaded, where it has no real existence. Most modern stables are built with stalls from six to seven feet wide, with plenty of room

behind the horses, to allow of passing, without incurring the danger of being kicked :—in such a stable sink a second heel post at just sufficient distance from the wall, to allow a free passage ; and take the space, so gained, into the stall ; close it with a gate, and you will have a very fair substitute, in the absence of a better, for a loose box, and that too without sacrificing a standing for a horse : but, if a stall can be conveniently spared, a four stalled stable may be converted into three very good boxes by shifting the divisions, and taking in the space in the rear of the horses.*

Upon the whole I very much prefer this kind of arrangement (with of course as much space as can be afforded to each division) to boxes separated from each other by walls ; for the horse is naturally a social animal ; and his enjoyment is greatly increased by seeing, as well as hearing, his companions. The best kind of partition between such boxes is "brick noggin," cased on each side with board, and surmounted by iron rails : the former may be about five feet in height, and the latter about two.—But as the wall approaches the manger, its height should be increased, and that of the rails diminished, so as to prevent the horses watching each other while they are feeding. When one horse can overlook another, while they are both feeding, it is very apt to cause them to swallow their food without properly masticating it, either from the hope of participating in their neighbour's share, or the fear of losing some portion of their own.

The question of space may be fairly left to itself ; for, if there be positively none, there ends the matter ; and if it be doubtful, that trite adage, "where there's a will, there's a way" will give

* Plate 8, fig. 2.

the horse the benefit of the doubt. But the real objection,—that which lurks at the bottom of all the others, is the power a loose box gives to the horse of lying down, and "dirting" himself, after he has been made clean for the day: this is the insurmountable objection, that has hitherto so stoutly withstood the pleadings of humanity for the poor horse: and perhaps, while the question rested solely upon that ground, the groom might be in some degree excused for striking the balance between *his* trouble and the horse's enjoyment, in his own favour; but now that the blessing of sound feet is shewn to be involved in it, there can be very few grooms, indeed none worthy the name of groom, who would not willingly incur twice as much trouble, to secure such a benefit to their horses: and, when horse-masters once become thoroughly alive to the importance of this matter; when they remember, that the natural life of a horse is from thirty-five to forty years: and that three-fourths of them die, or are destroyed under twelve years old—used up—with scarcely a foot to go upon, I take it they will be very apt to transfer their sympathies from the groom and his trouble to their own pockets, and their horse's welfare.

The apathy which prevails upon this subject, and checks any thing like energetic and well directed efforts towards amending the treatment of the horse, is attributable to the false notion, which is too commonly entertained, that if a horse performs his work moderately well for five or six years, he has done all that could reasonably have been expected from him; and therefore, as the phrase goes, "he owes his master nothing." It is quite true that five or six years labour is an ample return for the treatment received by *most* horses; but when they have been the

subjects of judicious management,—double the length of service may fairly be expected from them—indeed any thing short of that period, should be considered as leaving them their master's debtor.

A favourite argument with that numerous class, who are contented to follow in the track of their neighbours, is—that horses have always been kept in stalls: therefore, say they, it cannot hurt them. This is very like the argument about skinning eels: custom may proclaim them to be used to it; but each individual experiences the selfsame torture as its predecessor, whether it be the eel deprived of its skin, or the horse of the soundness of its foot. Unluckily the progress of disease in the horse's foot is, for the most part, so gradual, as to escape the notice of common observers almost entirely, until it is forced upon their attention in the form of palpable lameness; when the real cause is naturally enough overlooked, in the desire to fix it upon some recent occurrence. If the advocates for continuing the use of stalls will inquire among horse-masters in general, whether they have ever been obliged to part with a horse for lameness, the cause of which they could never distinctly trace? the answer they will assuredly obtain, coupled with the foregoing observations, I will venture to hope, may lead some of them at least to suspect, that the time honoured stall, may very fairly be charged with a considerable share in the mischief.

The real fact is that nothing short of a miracle can save a horse, which is habitually confined day after day to one spot, from most destructive changes in the delicate and complicated mechanism of the foot. The greatest amount of care and attention, that we can bestow upon the form and fastening of the shoe, will

avail him little, if the foot to which it is attached be not permitted to move. Frequent and regular motion is *absolutely essential* to a sound and healthy condition of the horse's foot; and any expectation of retaining *perfectly sound feet* with stalls and rack chains involves an impossibility—and never will be realized.

It is sometimes alleged as an objection to loose boxes, that they offer great facilities to gross feeding horses, to eat their beds; but as this evil naturally suggests its own remedy, I should not have noticed it, except for the purpose of calling attention to a particular form of muzzle that I invented some years ago, and have found to be effectual in preventing this evil (for a very great evil it unquestionably is), while it secures to the poor beast his free breathing.*

The two muzzles in common use are extremely inconvenient, and objectionable: a horse soon learns to eat through the open one, while the closed one, usually called a setting muzzle, is so insufferably hot and suffocating to wear, that it amounts in fact to an instrument of torture.

Having said thus much about keeping the feet in a sound and healthy condition, it may be well to inquire what precise meaning attaches to the expression "sound feet," as it is met with in common use: because perhaps there is no word in the English language, which in its true and legitimate signification implies *so much*, and in its almost universal acceptation *means so little*, as the word *sound*, when applied to horses' feet. The great latitude extended to the meaning of words in horse dealing transactions has shorn the one in question of every attribute, which gave it value, and has reduced it to a miserable cheat,

* Plate 9.

conveying no other guarantee, than that the horse is not palpably lame in *one foot only;*—for if he should chance to be lame in both fore feet, the pain of allowing the weight to rest upon either will cause him to pass it as quickly as possible from one to the other, and not only save him from condemnation, but most probably gain for him the reputation of being a quick stepper.

The truth is, that a foot, afflicted with inflammation and pain sufficient to deter a horse from bearing a fair share of his weight upon it, cannot be considered to be in a sound condition; and so long as the disability continues, so long is the foot unsound. The various degrees of "*pointing,*"—ranging between the occasional partial withholding of the weight from the heel, without advancing the foot,—perceptible only to the most practised eye,—and the habitual thrusting out of the whole leg to the front,—palpable to every beholder—are so many indications of pain in the foot;—the intensity of the pain being marked by the degree of pointing;—and in spite of the determination to consider them as mere variations of a trick, they are unequivocal symptoms of unsound feet. The horse is far too wise an animal ever to inconvenience his whole frame, merely to gratify a particular trick;—and I take it, his reason for pointing will be found upon investigation to have much more to do with a desire to relieve himself from pain, than an inclination to indulge a caprice. The act of pointing calls upon him to withdraw half the support from half of the base, on which his body stands, and that too at a part, where it can least be spared;—where his head and neck overhang it—and tend to throw a great increase of weight very unevenly upon the remaining support, thus forcing him to

equalize the pressure, as soon as he can, by dividing it between the remaining support and the leg of the opposite side behind. Experience has taught him, that this is best effected by adjusting the balance, before the removal of the suffering foot from the ground; and we accordingly observe him commencing the process by withdrawing the support of the hind leg, and then, having arranged the balance to his mind, he raises the foot, intended to be rested, and carrying it forward, deposits it at such a distance from the base, as shall insure to it perfect exemption from sustaining any of the weight. We can readily imagine that an animal, formed to stand upon four legs, would find it an irksome business to support himself for any length of time upon two; and so in practice the horse finds it to be; for his muscles soon become weary of their increased work, and he is driven to seek relief from the new pain by a change of position, which again calls forth the old one; and thus the poor beast is doomed to a perpetual alternation of painful sensations. His courage enables him to bear a great deal of pain without flinching, particularly when it increases upon him in the stealthy manner, that usually marks the course of unsoundness in the feet. There is however a point, beyond which his endurance cannot be stretched; and the progressive nature of unsoundness is sure in the end to find it out: and although he may contrive by shortening his step, and striking the ground less forcibly with his feet, to put off the discovery, and may continue to work upon very unsound feet even for years, still he is at last compelled to yield: and, sinking his head and neck at every step, to remove their weight from the foot, at the moment it meets the ground, declares by signs no longer to be mistaken,—that he is decidedly lame:—and this in

all probability is the first intimation which the master receives of any thing being amiss with his horse's foot: and he then in his innocent astonishment begins recalling to mind the events of the last few days, vainly hoping to find in them the cause of this unlooked for calamity.

Few circumstances appear to arouse a horse-master's indignation, so much as an imputation upon the soundness of his horse's feet: but surely this extreme sensitiveness is not very philosophical, where the tendency of the whole treatment of the animal is to make them unsound. It would be more rational to admit the unsoundness, and adopt measures for removing it, than to deny its existence, and persevere in the treatment that caused it.

A horse in work with perfectly sound feet is of much rarer occurrence than is generally supposed; but fortunately perfect soundness of foot is not absolutely essential even to the performance of a vast deal of work, in what is called very good style, as is proved by the feet of a great majority of the horses that perform wonderful tasks to the entire satisfaction of their masters: it is nevertheless a very desirable attribute, and will amply repay any trouble that we may take to ensure it—not only in the extent to which it prolongs the horse's usefulness, but also in the free, willing and agreeable manner, in which his work is done,—carrying conviction on the face of it,—that it is unaccompanied by pain.

The influence of regular daily exercise upon the health and well being of the horse is generally much too lightly esteemed both by masters and grooms,—who seem for the most part agreed that there is no great harm in a horse remaining in the

stable for two or three days in succession without exercise, provided that his legs do not swell; but I trust that I shall have prepared many of my readers to believe with me, that it is far otherwise than indifferent to him, whether he be imprisoned day after day, with the elastic machinery of his foot wasting and decaying from want of use;—or be afforded the opportunity of keeping it in vigorous and healthy repair by due employment out of the stable for three or four hours every day.

It would be almost impossible to over-rate the value of daily long continued walking exercise to the health, condition, soundness of feet, and general usefulness of the horse; and whoever habitually deprives him of these blessings, merely to save himself a little trouble,—inflicts a cruel and lasting injury upon a generous and unoffending animal, and is unworthy to be intrusted with the care of him. Old horses require less exercise than young ones; but as the quantity usually allotted to horses of every age falls short of the portion necessary for the very oldest, there is little apprehension of any receiving too much. The perfect allowance for horses in health, of from five to fifteen years of age, would be four hours a day; two in the early morning, and two in the afternoon:—but as it requires an extensive stable establishment to carry this plan into effect, especially where there are many horses kept,—it will be more to our purpose to consider the *smallest possible quantity*, with which we can hope to keep our horses' feet in a sound and healthy condition:—this I should put at two hours a day;—and a pitiful allowance it undoubtedly is in a case, where nature has dictated almost constant movement: but so niggardly are horse-masters in general of this most essential requisite, that they will

scarcely ever allow their horses more than from half to three fourths of an hour daily;—and we find men, who are profuse in the expensive luxuries of excessive feeding, clothing, and pampering, turn wonderful economists in the inexpensive necessaries of air and exercise.—Trotting a horse to and fro upon a hard road for half an hour, just to stretch his limbs, and keep them from swelling, is too frequently considered to be fully sufficient exercise for the day:—and I verily believe, if men could ride better, and horses' legs did not swell from long continued confinement, many horses would never be exercised at all beyond their positive work:—but most men are very sensitive about the slightest appearance of swelling in their horses' legs;—and nature has implanted in most horses such a lively mode of expressing their joy at the change, from the close atmosphere of the stable to the freshness of the open air, that a kind of compact seems formed between pride and fear, to extort for the poor beast at least sufficient exercise, to keep his legs fine, and his exuberant spirits within *ridable bounds*.

The only other subject, requiring especial notice, is the treatment of the foot in the stable;—the directions for which are few and simple. The horny crust has a great tendency in almost all feet to become dry and brittle, and to lose its elasticity, which disposes it to curl inwards upon the internal parts of the foot:—this we should endeavour to prevent, as much as possible; and the best applications for that purpose are grease and moisture; I name them in conjunction, because I think they should always be employed together;—that is, the use of grease should always precede the application of moisture:—the latter will keep the horn soft and pliable during the continuance of its application to

the hoof; but it is no sooner discontinued, than evaporation takes place, and the horn becomes as hard and brittle as before: whereas if the hoof be well rubbed with some greasy mixture, so as to fill the small spaces between the fibres of the horn, before the damp is applied, the hoof will derive the full benefit of the cold, and be left, when the evaporation is over, in a tough and pliable condition.

The following ointment will be found to answer the purpose admirably, and, if it be freely used to the sole and frog at night before the feet are stopped and to the crust in the morning after the horse is dressed, it will keep the hoof in an elastic and healthy state. To a pound and a half of lard add a quarter of a pound of tar—a quarter of a pound of honey, and a quarter of a pound of bees wax: melt the lard and bees wax together, and stir in the tar and honey, and if, when cold, it should be too hard,—re-melt it and add a little olive oil.

Whenever there is heat in the foot, the use of cold water for two or three hours at a time is often very serviceable,—and the best mode of applying it is to place three or four thicknesses of horse clothing together of nearly the depth of the hoof, and having sewn the top edges together, attach a small buckle and strap, and fasten it loosely around the pastern joint above the hoof: plunge the foot into a bucket of water, and keep it there until the cloth is thoroughly saturated with wet; then remove the bucket, and allow the wet cloth to remain on, re-wetting it occasionally. This should never be done, when the horse's foot is heated from recent exercise, as the sudden chill at such a time would most likely bring on fever of the feet. The early morning suggests itself as the fitting time for the employment of this

remedy, when the horse is nearly certain of having been at rest for many hours.

Stopping the feet at night is a very beneficial custom; and fresh cow dung is perhaps as good a thing as can be employed for the purpose:—it retains its moisture longer than clay, which is often used, and when dry is less hard in the feet. The space within the shoe, between the sole and the ground, being thus filled with an elastic mass, affords an even support to the whole under surface of the sole, resembling in some degree, what the unshod foot receives from soft ground; and, I believe, the foot derives as much benefit from this slight, but even support, while the horse is at rest, as it does from the softening effect of the moisture upon the horn. The fear of causing thrushes by the frequent use of wet stopping is very much exaggerated; for where the disease is produced by moisture once, it is produced by bad shoeing a thousand times:—indeed it is one of the commonest effects of the restraint to the foot of bad shoeing, and never occurs under any circumstances, where the foot is left free to expand by good shoeing. The surest and never failing cure for thrushes, is "one sided nailing"—in other words, permitting the foot to expand. I have cured two bad cases of thrushes of long duration, by making the horses stand for four months upon wet sawdust without shoes. The sawdust was not merely damp, but saturated with water;—and the horses remained upon it all day, but were removed at night into a dry place to sleep. Neither the long continued application of excessive moisture, nor the gloomy predictions of friends could prevent the thrushes from getting well, when the foot was thus permitted to expand freely to the weight of the horse.

I may observe here, that this kind of treatment is far prefer-

able to turning horses out, either to grass, or straw yard, and should always be substituted for it, whenever from any cause they may require rest.

Of course the continued use of wet sawdust will only be needed where the feet are much amiss; but I believe that every horse, which is laid up with a view of obtaining perfect rest for him, will be benefitted by standing without shoes upon it for two or three hours out of every twenty four;—unless indeed he should happen to have weak flat feet; in which case I should shoe him with leather:—the soles of such feet being for the most part already too thin would be rendered less able to resist the weight from above by the softening effect of immediate contact with so much moisture; I would not however on that account deprive the remainder of the foot of the benefit to be derived from it.

It is essential that the floor, upon which a horse is to stand for any length of time without shoes should be tolerably free from irregularities of surface, particularly that portion of it, upon which he is to pass the night;—for, although a mass of wet sawdust may afford some slight defence to the feet by day, a layer of dry straw will be found but a sorry protection by night. I have lately seen a striking instance of the ill effect of standing without shoes upon a roughly pitched floor by night, in a horse, whose original ailment was of a trifling nature, and which rest without shoes upon wet sawdust would no doubt speedily have removed, if the bad paving of the floor had not converted it into a very serious case by so bruising his feet, as to cause abscess to form between the horny and sensitive soles, to let out which it became necessary to make an opening through the horny sole.

The advantages of a loose place over turning out are too

numerous to be enlarged upon in a work of this kind; I may however mention a few of the most prominent;—the chief of which, as regards our object of obtaining entire rest, is the insurmountable obstacle thus placed in the way of the violent galloping, which horses from various causes are apt to indulge in when at grass: it also prevents the incessant stamping consequent upon the insufferable teazing of flies; and it offers the further advantage of enabling us to regulate the food, both as to quantity and quality—a matter deserving much more consideration than is usually bestowed upon it.

In conclusion I will beg to offer a few remarks upon the false estimate usually made of the value of a warranty. A general warranty, as regards the soundness of the horse, is valueless;—for, if he be unsound, it cannot make him otherwise. Its only worth therefore, when stripped of its supposed mysterious, charm-like influence over his state,—consists in the authority, with which it invests the buyer to proceed against the seller in a court of law, qualifying him to expend many times the amount of the purchase money, to prove that he has been either wilfully or ignorantly deceived. Now instead of placing implicit confidence in such an instrument as this, or resting satisfied under its protection, it would be much wiser, upon making a fresh purchase,—in addition to the warranty, to have the horse examined by a veterinary surgeon, who will at once detect any *palpable* defects, that may present themselves:—and then,—being armed with the general warranty on the one hand, and the veterinary surgeon's certificate on the other,—to set steadily and perseveringly to work,—by good shoeing,—a loose box,—and plenty of exercise, to endeavour to *make* him sound.

THE END.

APPENDIX.

The very flattering reception given to my book by the public, and the lively interest taken in the system therein laid down, evinced by the numberless letters, I have been honoured with from all parts of the kingdom, render it incumbent upon me to avail myself of every opportunity, that offers, of imparting further suggestions, as they occur to me, or, I might almost be permitted to say, are forced upon me. To this end I have chosen the form of Appendix, as being less objectionable than isolated sentences distributed throughout the body of the work, wherever they might happen to apply, often disuniting the subject, and breaking the connection of the parts. It is always desirable in practical works to have new matter so arranged, as to be readily available to the inquirer, enabling him at once to determine for himself the probable amount of its value, and its immediate bearing upon, what has been previously asserted. Fortunately further experience does not call upon me to retract anything, which I have already put forth, unless I except some half expressed doubts and fears about the sufficiency of six nails for hunting, and five for general purposes: as however retracting a doubt is only pushing on in the old direction, I need be under no apprehension upon that head. The experience of the past year has confirmed

all my former views, and dissipated the few misgivings, which I had felt, of the applicability of the system to the shoeing of hunters even in a deep country.

Before however so desirable a practice can obtain general use, some powerful prejudices, which prevail with about equal force among many horse-masters, grooms, and smiths, must be entirely relinquished; for instance the notion, that bringing in the heels of the shoe necessarily contracts the foot, is one, that finds numberless supporters among men, who would blush to be as little informed upon other matters. A very small acquaintance with the nature and offices of the parts, composing the foot, will suffice to dispel this, as well as the equally unfounded fear, that the smallest pressure of the heel of the shoe against the frog will lame the horse.

The principal argument however, upon which the uninformed ground their objection to bringing in the heels of the shoe, is the necessity, which they affirm to exist, for affording the horse more support at the heels, than nature has given to him; and which, they say, my plan entirely deprives him of. Now what does this argument amount to? Neither more nor less than a declaration, that the Almighty Creator of the Universe has failed in imparting to the horse's foot the form, best suited to his requirements; and has delegated to the puny intellect of man the task of devising a remedy. Surely the stoutest stickler for the infallibility of old plans and old prejudices will shrink from subscribing to such a doctrine as this: but, cavil as they may, it comes to this at last: either the foot is of the shape, best adapted for its destined office, or it is not; and if it is of the right shape, which I maintain it to be, why should not we in making a shoe for it implicitly follow

that shape? But suppose for a moment, that it does not possess the form, best calculated to support the horse under all circumstances, and that there does exist a deficiency of width at the heels, do the projecting portions of shoe meet the difficulty, or supply that deficiency? I think not; for they can only support, what rests upon them; and the bare fact of their projecting beyond the foot at all shows, that no portion of the horse or his foot so much as touches them, much less derives efficient support from them; therefore to say the least of them, they are useless appendages.

Nothing is needed but the abandonment of a few such-like absurd and untenable prejudices to make one-sided nailing as universal in the shoeing world, as the percussion lock has become in the sporting world: the improvement is equally obvious, and the adoption of it equally easy: but there is this single unfortunate difference, which prevents its equally rapid spread; the one applies itself directly to increasing the *comfort* by facilitating the *sport* of man; while the other almost entirely confines itself to diminishing the *suffering* of the horse. If the horse could only possess himself of the dog's power of appealing to men's sympathy through their ears, the hardest hearted among them would sometimes be made to sicken and turn away from acts, which they now perpetrate with the utmost complacency, solely because the poor brute suffers in silence.

If men's minds could only once be dispossessed of the preposterous notion, that nature, so perfect and beautiful in all her other adaptations, has deviated from her general plan in forming the horse's foot, every difficulty, attending one-sided nailing with few nails, would vanish like smoke before the wind. I was much

struck the other day with the force of the following observation, coming as it did from a gentleman, who for some time resisted the plan, as an innovation, but, having at length made himself master of its details, gave in his adhesion to it; he said, "there can "be no mixing of the two plans; one must be *entirely* right, and "the other *absolutely* wrong; they cannot *each* be right in *some* "things, and wrong in *others*." Now sweeping, uncompromising, and dogmatical, as this conclusion at first sight appears to be, and calling, as it seems to do, for the unscrupulous adoption of new suggestions, to the entire exclusion of former practices, it will be found nevertheless upon closer inspection to resolve itself into the very modest and equally reasonable requirement, that the shoe shall be made *really and truly to fit* the foot, before it is nailed to it. This simple condition contains all the mystery and all the novelty to be found in the plan, advocated by me; and upon this single circumstance hinges the *certainty*, or the *impossibility* of retaining a shoe with a few nails. If the shoe *fits*, it is inconceivable, how little will retain it; but if it does not, then extra fastenings, wherever they can be applied, become absolutely necessary to oppose and overcome the great leverage, offered by the misfitting and projecting portions, which are always, be it remembered, situated at the back part of the quarters and heels; in other words, at the part of the lever, furthest removed from the fulcrum, where power is the most multiplied; as if the object really had been to render so simple a matter as retaining a shoe as difficult as possible. One gentleman told me, he had tried to shoe with six nails, but it did not answer; his horse had *cast a shoe;* and he had consulted a clever coachman about it, who had quite convinced him, that it might perhaps do for very easy

road work, but could never answer for any other. This conference entirely settled the question with him; and the facts of the 13th Light Dragoons having shod all their horses for years with six nails, of myself and several of my friends having used only five, and of his own horse having retained three of his shoes, all went for nothing against the opinion of this clever coachman. Now I happen to know, that the smith, who put on the shoe, said *at the time of doing so*, that he had never before shod so brittle a foot: this is the kind of evidence, upon which many a waverer has no doubt been induced to abandon the plan altogether; and strong evidence too, as far as he is concerned, for all, that he would ever know about it, would be the fact, that the horse was shod with six nails, and *had cast a shoe*. No one ever stops to enquire into causes, which he does not care to comprehend. The undue weight, attached to the opinion of smiths and stable people by the great majority of horse-masters, is a matter very painful to contemplate; it is the humiliating submission of conscious ignorance to the imperious dictates of inferior minds upon a subject, where a very few hours of earnest and well directed study would impart a degree of knowledge, more than sufficient to expose the shallowness of their advisers, and enable them to throw off their thraldom, assert their legitimate influence, and promote the comfort, usefulness, and durability of their horses.

Previous to the adoption of an opinion, it is always wise to ascertain, how far the habits and occupation of the person offering it may have qualified him for arriving at just conclusions upon the subject; and when we apply this test of opinion to the smith, such as he is usually found in country villages, we shall perceive, that this qualification to advise upon the horse's foot is remarkably

small. With an education, scarcely embracing the first rudiments of instruction, he is apprenticed at a very early age; his work from the commencement of his career is laborious and fatiguing; and the amount and duration of it are carefully apportioned to his increasing strength; so that the end of each succeeding day is made to repeat the same tale of fatigue of body, and disinclination to exert the mind; still he finds in the course of time, that he has gained some considerable knowledge of his art; he can point a nail, forge a shoe and fasten it to the foot *without wounding the quick*; but what this quick is, against the wounding of which he has received such special and repeated cautions, no one in the forge has been able exactly to inform him; yet he has learnt enough to know, that it is something to be avoided in driving a nail; and his having acquired the knack of doing so most probably stands him in stead of anatomical knowledge for the remainder of his life: and, as far as the practice of his art is concerned, in the way, in which ninety nine hundredths of his employers are contented to have it done, there is little need of his troubling himself to learn more about it: it is true, he occasionally talks of coffin bones, coronet bones, and even navicular bones, but he has no more distinct idea of their structure, offices, or position in the foot, than he has of the man in the moon: how should he? Such knowledge does not come by instinct; and there is nothing in the nature of his art either to force it upon him, or to induce him to apply himself to the labour of acquiring it. The smith is essentially a worker in iron and horn; and I should no more think of disputing the quality of the iron or the texture of the horn with him, than I should of yielding my opinion to him upon the elasticity of the foot, or the most scientific mode of fastening a

shoe to it: his daily practical acquaintance with the varying qualities of these materials must supply him with better means of judging of their condition, than I could ever acquire from observation alone; and therefore it is, that I should refrain from contesting the point with him: but in the other case, where his knowledge, if he possessed any, could only be the result of study, apart from his calling, I should most stoutly demur against acceding to his views, when they happened to clash with my own; because I consider myself more practically acquainted with the use of reason, than he can possibly be; and therefore more likely to arrive at just conclusions in a matter, depending entirely upon the right application of it.

Many persons attach vast importance to the experience, gained by a smith from long practice; but it is a great mistake to suppose, that anything worthy of the name of experience is gained by constantly repeating the same operation in the same way: greater dexterity may result from it; but nothing more, for, if it be begun upon a wrong principle, no amount of repetition can make it right, so that the utmost, to be expected from such experience, is a greater proficiency in doing wrong. It is inexcusable in gentlemen, whose education should have made it a comparatively easy matter to acquaint themselves with these things, to attempt to throw the whole burthen upon grooms and smiths, whose inadequate instruction in a great measure disqualifies them for the task, and renders it a great labour to them to comprehend, digest, and apply, what they read upon the subject. It is altogether beyond their powers to grapple with it; and they naturally fall back upon traditional error, which comes cut and dry to their hands; and, knowing that it has served the turn of former ages, they adopt it

in the full confidence, that it will serve theirs as well. But this should not satisfy a horse-master of the nineteenth century, when art and science are making giant strides in every direction around him. He should bestir himself, and inquire, why things are so; and not, as heretofore, rest satisfied with being told, that they are so, because they have always been so; he should no longer receive a mysterious nod of the head, as an unanswerable argument, or an unsupported doubt, as the matured conclusion of absolute wisdom. His interest as well as his duty demands, that he should inquire for himself the rights of the matter; for it not only involves the comfort and durability of his horse, but his own personal safety; and the moment that the groom and the smith find him becoming practically acquainted with the subject, they will both follow his lead. There are very few of either class, who are not anxious and willing to receive instruction, when they are once assured of the competency of their instructor; but they cannot be expected to relinquish long cherished notions at the bidding of everybody, who chooses to say to them, "you are wrong in this or in that," without being able satisfactorily to explain his objection, or demonstrate the superiority of the plan, which he proposes to substitute. Many persons will no doubt be inclined to ask, what it is, that I require them to do; whether I really mean, that it is incumbent upon them to make themselves proficients in the anatomy and physiology of the horse's foot in all its varied details: I answer, certainly not: it is a dry and difficult study, possessing few charms for the general reader, and ill suited to the tastes of the majority of horse-masters; nevertheless a knowledge of the mere outline of it, such as I have sketched in the beginning of the book, would amply repay the trouble of learning; but even this, superficial as it is, is by no

means essential to a very perfect and practical acquaintance with the principal, upon which every horse ought to be shod.

Where there is no previous knowledge to start from, something must always be taken upon trust: the case before us fortunately demands but a small exercise of blind faith in other men's conclusions; it only calls for the concession of two self-evident points; first, that nature knows better than the smith, what is the best shape for the horse's foot; and next, that the greatest elasticity of the hoof is at the inner quarter and heel. Let these two axioms be unconditionally granted, and the rest may confidently be trusted to the reasoning powers of any man, possessed of common sense; for, if nature is right, follow her implicitly, and submit to no officious interference from man; and, if she has made the inner side of the hoof to expand the most, take a lesson from her in that too, and do not fetter it with nails. The experience of the last year has made me very bold upon this point; in truth it has fairly astonished me; for, convinced as I was of the inestimable value to the horse of one-sided nailing with few nails, and prepared as I was to push the system beyond, what many persons considered prudent limits, still I confess, I was wholly unprepared to find, that, instead of a rash adventurer, I had been but a temporizing coward, permitting myself to harbour doubts in cases of absolute certainty; as however it is not my habit to jump to conclusions, I do not regret the course, I have adopted; it has allowed the further experience of a whole year gradually to unfold, what I might perhaps have arrived at sooner as a speculative conclusion, but could scarcely have secured as an indisputable result. When I wrote the book, I entertained some doubts about the efficiency of six nails for hunting in almost any country:

I now fearlessly assert, that they are fully sufficient for any country in the world: I then cautiously hinted at the possibility of others being able to do hack work with five nails, as I was doing myself: I am now convinced, that more than five are never required for any hack work, excepting to counteract *very defective fitting:* but I do not rest even here, for I am prepared stoutly to maintain, what would have staggered me a year ago, viz. that it is a mechanical impossibility for any kind or description of ground to pull off a shoe, that has been *properly fitted* to the foot, even though it should be fastened by five nails only. This no doubt will appear to many to be a rash and hazardous assertion, but there is no proposition in mechanics, of which I am better assured: let me however stop here to repeat, for it cannot be too often said, or too strongly impressed upon the mind, that *the shoe must fit the foot:* there must be no trimming, to meet old prejudices; no leaving just a little here or a little there. It has been settled above, that nature has made no mistake; neither must we; we must follow her outline of the hoof, as closely as possible. If we desire the smith to put on a shoe at random, he answers at once, "I must fit it to the foot first:" *pin him to that;* make him fit it to the foot first, and then you may defy any ground to remove it. The success entirely depends upon this *fitting of the shoe to the foot;* for, if the smallest portion projects, even the sixteenth of an inch, either at the quarters or *sides* of the heels, but particularly at the inside heel, it is fatal to the security of the shoe; it offers a handle for the ground to work by; a sort of request, that it will be good enough to pull it off: but, where the fitting is complete, how, I would ask, can the ground pull it off? The foot by its expansion, when the weight

is thrown upon it, makes a hole larger than the shoe, that precedes it; and, what possible resistance can be offered to the return of the shoe by a hole larger than that, through which it entered: but, supposing the ground could offer a resistance, where is it to obtain its purchase? There are no projections anywhere; and the ground cannot exert an influence, where there is nothing to hold by.

It may be objected here, that I have entirely overlooked the power of suction; but I answer, that, when the circumference of the ground surface of the shoe is kept somewhat within that of the foot surface, as in the shoe described a little further on as the hunting shoe, a kind of wedge-like effect is imparted to the whole, and the power of suction reduced to almost nothing.

But enough of theory: a few well authenticated facts are more convincing than volumes of speculation. Before however we deal with the facts themselves, it may not be amiss, if I account for so many having fallen under my own observation.

Immediately after the publication of my book, a great many persons, as if by common consent, paid me the compliment to consider me public property, to be consulted at their pleasure. I took no measures to check this notion, because I at once saw, that it offered the readiest and most effectual means of spreading a system, which I firmly believe to be overflowing with good to the horse and advantage to his master; so I gave in to it, and, whenever it was practicable, attended at the forge, and directed every stage of the operation myself; which frequently afforded me the opportunity of instructing master, groom, and smith at the same time; and I must say, that I have been very agreeably surprised to observe the evident interest, smiths have taken in the matter, and the great

attention, they have paid to the reasons, I gave, for what I required them to do. I am quite convinced, that they are for the most part fully prepared to follow a good lead: but it is very disheartening to take great pains for an employer, who neither knows, cares for, nor appreciates the difference between good work and bad: it is not in human nature to continue exertions against such a depressing drawback; and here let me mention, that a smith, unaccustomed to *accurate* fitting of a shoe, will at first find it to be a task requiring some pains: his head, hands, and hammer will all endeavour to go in the old direction: but very little practice will enable him to shoe a horse in the same time, that he occupies about it now, or indeed in less; for he will have fewer holes to make, and fewer nails to point, drive, and clench down.

During the early part of last year I experienced great difficulty in persuading many of those, who consulted me, that six nails were fully sufficient for all their purposes: but, when they at last consented to try them, each experiment made it more and more evident, that it was so; and the fact became established beyond dispute. I then pressed hard for; five and those, who gave in to me, were astonished to find, that leaving out a nail had made no difference whatever in the security of the shoe. Thus matters went on, until the arrival of the hunting season, I having in the mean time superintended the shoeing of as many horses, as a veterinary surgeon in full practice. I now determined, if any friend would lend himself to my project, to set at rest the much disputed question of the capability of six nails to hold a shoe through a long day in a heavy country: unhappily for me an old weakness in the back prevented my doing it for myself: it was not long however, before I found, what I desired, in a gentleman,

who had worked three horses through the summer with five nails, and who very kindly offered one of them for my experiment. He had some misgiving at first, and, although his horse carried him more pleasantly than usual, he never could entirely divest himself of the idea, that a shoe might possibly be lost; and not without reason, for this horse, when shod in the usual manner even with eight nails, was remarkable for casting his shoes: but one day a sharp run over a deep clay country so effectually quieted all his doubts and fears, that he has never thought of his horse's shoes since; and, after wearing out three or four pairs of such shoes, he offered his horse, to be shod with five; this also proving successful, he volunteered a second; and they have both continued to carry their shoes safely through some trying days. He once for a moment thought the charm was broken; he was informed in the middle of a run, that his horse had cast a shoe: but upon examination it proved to be the shoe of his neighbour's horse with *eight* nails in it. Another gentleman allowed me to shoe one for him with six nails, which I have now done four times with the most satisfactory result. The horse cut so badly, that they were always obliged to shoe him upon the one-sided plan; but they did not manage it well; and the shoes were frequently found after hunting to have shifted so much upon his feet, as to require to be replaced. When I first saw him, they were fastened with nine nails and two clips, which I speedily reduced to six nails and one clip. It was in directing the shoeing of this horse, that I discovered the kind of shoe, which I call the hunting shoe, and which I say it is impossible for any ground to displace. To provide against his cutting, I caused the inner limb of the shoe to be made somewhat narrower than the outer, with the edge receding, as it approached the ground, so as to

prevent its striking the opposite leg ; and I also omitted the seating on the foot surface of this limb, merely substituting in its stead the removal of the upper edge towards the sole with a file ; and, the moment I saw this shoe attached to the foot, I was convinced, that it might bid defiance to any thing short of the smith's pincers to remove it ; for there could be no fear for the side with four nails in it, and as to the other, there was nothing whatever to lay hold of, for one edge sloped from the foot to the ground, and the other was perpendicular to it. It turned out, just as I had predicted : the shoes were not only retained without shifting, but, when they came to be removed at the end of a fortnight, not a clench had started. So certain am I of the security of this kind of shoe, that, whenever I see the shoe fitted myself, and nailed to sound horn, I meet all doubts by saying, " if even a clench rises at the end of a fortnight, I am willing to allow, that I have failed."

The next case, I have to record, is a very strong one : a friend requested me to superintend the shoeing of a large, heavy, useful mare. I begged him to try five nails : he said, he would do so another time ; but he wanted the mare to assist in ploughing a stiff piece of ground on the morrow, and he was afraid to trust five nails. I succeeded however in persuading him to submit, notwithstanding his firm conviction, that she would leave her shoes one after the other at the turn of the furrows. He drove her home fifteen miles that evening, and the next day wrote me, that she had ploughed from nine 'till twelve, and returned to the stable with her shoes as firm on her feet, as when she left the forge ; and so they continued, when I saw her a fortnight afterwards. The shoes were of the ordinary make, with the web of equal width all round. This case led to another friend

volunteering his horse for five nails for hunting: I accordingly attended at the forge, and saw, what I have described as the hunting shoe, put on with five nails. The horse returned from his work, as I expected he would, with his shoes all right, and he has since worn out four pairs of such shoes.

I have been enabled to prove the sufficiency of five nails for carriage work beyond all dispute through the kindness of Mr. Cockram, the mail contractor, of the New London Inn Exeter, who has permitted me to try the plan upon the horses of the day mail to Falmouth, the fastest mail in England; and the result is in the highest degree satisfactory: the shoes not only continue firm upon the feet, but not a single instance has occurred, of a clench having started.

While I was writing the above, an Officer of the Horse Artillery, who happened to be on a visit in Exeter, was so good as to call upon me for the purpose of informing me, that the troop, to which he is attached, stationed in the north of England, had tried my plan very successfully both upon the officers' and troop horses, many of which had worked for some months past with five nails only. It had not been tried upon the gun horses, but it was in contemplation to do so. He also told me, that he has hunted all the season with five nails, and that it has never entered his head, that he is to lose a shoe. A troop of Dragoons at a neighbouring station had also adopted the plan with equal success upon troopers' as well as officers' horses.

These experiments confirmed the opinion, I had for some time entertained, that we had not yet found the limit of the power of five nails; and, as I could find no severer test to subject them to than those, which I had already employed, I resolved upon trying

what four would do; so I set to work immediately, and had my own horses shod with four, beginning with one, which requires to be shod with leather; and afterwards taking my carriage horses, as being those, in which it was least likely to answer: but, as no difference whatever presented itself, I followed with the others; and had then six horses shod with four nails only in each of their fore shoes. I next caused shoes, each weighing *twenty two ounces and a half*, and fastened with four nails, to be put upon one of my carriage horses, one nail only being placed in the inside leaving a space of six inches without any fastening whatever between it and the heel: at the end of five weeks neither shoe nor clench had moved in the smallest degree, although they had purposely been left thus long untouched.

The friend, to whom I have before referred, as having ploughed with five nails, has reported to me a second ploughing experiment, made with only four, and attended with the like success, the mare continuing to perform her ordinary work with four nails. This led to the trial of four upon one of the leaders of the above mentioned fast mail, which has answered perfectly; and the horse continues regularly to perform his rapid journeys over a heavy stage with his fore shoes attached by four nails only. Having thus ascertained, that four nails, properly placed, were equal to the task of retaining the shoe of a mail coach horse, I was induced to try, whether it was possible to effect a further reduction, and still retain the shoes; so I had one of my own horses shod with three nails only, one placed in the back part of the outer quarter towards the heel, another in the front part of the same quarter towards the toe, and the third in the inside toe; and, after driving him more than a hundred miles with shoes so fastened without

the smallest shifting of either shoe, I adopted the like number with three of my other horses, and at the time of going to press, I have four horses doing their work with fore shoes, varying in weight from fifteen to twenty two ounces, securely retained on their feet by three nails in each shoe.

Since the publication of the preceding edition of this treatise I have had seven months' additional experience in the use of three nails; during the whole of which time all my horses have been shod with that number; and, with the view of testing the security of the plan to the utmost, three of them have constantly had the addition, of leather; but notwithstanding this drawback I have lost only *one* shoe, and that was occasioned by the breaking off of the head of a nail.

These last experiments are not recorded with a desire of inducing others to trust to such slender fastening, for, however desirable it may have been to ascertain with precision the smallest number of nails indispensable to the security of a shoe, it by no means follows, that it is therefore either prudent or expedient to adopt it for general use. The chief value of such knowledge is the unanswerable argument, it supplies against the supposed necessity for seven or eight.

I do not know, that any very great advantage is to be expected from three or four nails over five, further than the confirmation of the valuable and important fact, that a shoe can be securely retained by a few nails; and, that being the case, the fewer we employ in reason the better; because, the smaller the number, the larger the intervening spaces of sound horn to nail to at the next shoeing.

Many persons will no doubt be inclined to ask, how it happens, if this really be a matter of such vast moment, as I represent it, that veterinary surgeons and farriers have never made an effort to

arouse the public to a sense of its importance: I answer, that, although there is not one of either class, who would not admit, that it is most desirable to leave the foot free, as far as a due regard to the security of the shoe will permit, still there are very few, if any, in a position to have experimented upon it, as I have done: very few keep more horses, than they have positive work for; and therefore they cannot afford either to be thrown out in their journeys, or to risk laming the horse by continuing them, if he should chance to throw a shoe: and they are not very likely to meet with patriotic friends, who would lend them horses for experiments, which they had declined to make upon their own. But there is another and a stronger reason to deter them from prosecuting any very fine drawn experiments upon the subject; I mean the excessive sensitiveness of the public about casting shoes: it is the only circumstance, connected with shoeing, to which they are thoroughly and practically alive. Some persons even carry the matter so far, as to impose a fine upon the smith, whenever their horses lose a shoe, particularly if it should occur in the hunting field; and the great test with most of them of a good shoer is, that his shoes are never cast. While this is the state of the public mind, it would be highly imprudent for a veterinary surgeon or farrier to risk its being said, that his horse had lost a shoe: that it was the result of an experiment, would in no wise save his reputation with the public: the fact would be remembered, but the cause forgotten.

To put forth a mere theory, unsupported by facts, would do no good: the public are very shy of being made the vehicle for supplying facts to bolster up a theory, especially in cases, where a failure entails inconvenience like that of casting a shoe.

Mr. James Turner is the only veterinary surgeon, who has

grappled with the subject in earnest; his great discovery of the nature and causes of navicular disease led him first to adopt the system of one-sided nailing, as a preventive; and the two taken together may with truth and justice be pronounced the most valuable and important addition, that has been made to veterinary knowledge for ages past: but it would never have answered for him to have endangered a great principle by too minutely carrying out its details. He established the important fact, that horses could work in shoes, nailed on one side only, leaving the foot on the other side free to expand: this was an immense point gained, and it only remained for some idle man, like myself, with inclination and means, and no reputation to lose, to make these extra-professional experiments, to show even to Mr. Turner himself the wonderful working of his invaluable system.

No horse experiences the full extent of the benefit of one-sided nailing with few nails, like the hunter: it is a great boon to every horse; but to him it is a blessing of the highest order, and one, in which his rider participates more largely, than some appear to imagine. When a hunter is shod in the usual manner with seven or eight nails, some are always for the sake of security placed in the inner quarter, the most expansive portion of the hoof. Let a horse, with his feet so circumstanced, be called upon to leap from the top of a high bank into a hard road, and what happens? The weight of the horse and his rider are thrown with an impetus, which greatly increases both, upon the bones of the foot; these are jammed with immense violence into the hoof, both sides of which are so fettered, that neither can yield to make room for them; and they consequently squeeze the exquisitely sensitive lining of the hoof between their own hard substance, the un-

yielding horn, and the shanks of one, two, or three nails, as the case may be, in a most merciless manner. The effect of this upon the horse may be readily realized to any one, who will jump down from a height on a resisting floor in boots, a little tight: let him repeat the feat several times, and he will practically understand, why it is, that horses sometimes topple over after down leaps towards the end of a day. Many horses are more beaten by pain in the feet, than by the severity of the run: the pain causes them to step shorter, and consequently quicker; this, together with the irritation arising from the pain, makes them breathe quicker and sweat more, and in the end takes fully twice as much out of them, as the same run would have done, if they had not suffered pain in their feet; this again man can prove upon himself by a small experiment: let him supply himself with a pair of shooting shoes, that are tolerably easy, when he sits down, or even when he stands up; but let there be a seam, or something else, which hurts him just a little, whenever his weight is thrown upon one foot, as in walking: thus equipped let him go through a day's shooting, and say in the evening, whether the distance or the shoes have taken the most out of him.

It has been suggested to me many times during the last year, that the publication of a few plain directions for the guidance of country smiths would aid materially in extending the system, which I have advocated; but I am inclined to think, that the object will be far better obtained by adhering to my original plan of writing exclusively for the information of the uninformed, and giving a detailed description of the preparation, fitting, and nailing on of a shoe, addressed to those, who have never been led either by interest, or inclination, to attend at the forge, where alone a

thorough and practical knowledge of the process is to be gained. I have availed myself of the art of Glyphography, to execute my own illustrations, trusting that they may be found to make up in accuracy, what they unquestionably lack in ornament.

The preparation of the foot for receiving the shoe has been so fully treated of in the body of the book, that it is needless to advert to it further in this place : I will therefore at once pass on to the selection of a shoe. Every forge is expected to contain a supply of shoes, technically described, as "turned in the rough," varying in size, weight, thickness, and width of web, from which to make a selection ; this selection frequently calls for the exercise of a very nice discrimination on the part of the smith, so as exactly to accommodate the shoe to the requirements of the foot, about to be shod. A foot for instance with weak crust and flat sole will demand a broad web, considerably seated on the foot surface ; while a strong foot with an arched sole requires only a moderate width of web and little, or in many cases, no seating on the foot surface.

In the first case, if it were not for the space afforded by the seating, the shoe would press upon, and bruise the sole, whereas in the latter, if the seating were to be permitted, precisely the same effect would be produced by the admission of dirt and gravel between it and the shoe ; so that conditions, which are absolutely essential for one class of feet, are sometimes positively injurious to another.

The readiest way of determining the amount of seating, required for any particular foot, is first to apply the shoe "in the rough," and, if there be enough space for a picker to pass freely round between it and the sole, there need be no apprehen-

sion of their ever coming into injurious contact; while more space would engender the very mischief, which it was designed to prevent: the seating therefore in such a case should not be increased.

A shoe suited to the foot having been selected, the first thing to be done to it, will be to cut the rough, unfinished heels to the required length; and upon the direction, in which this is done, will mainly depend the accuracy, with which they can ultimately be made to follow the sweep of the hoof: the common practice is to cut them off square, whereby two corners are left at the termination of each limb of the shoe, preventing their ever being accommodated to the easy curve, by which the crust merges into the bars at these parts, as shown at *a*. *b*. Fig. 1: this can only be properly done by lengthening the outer edge of the shoe, and this is effected by cutting off the heels in the direction of the dotted lines in Fig. 2; the outer corner from *a*. to *a*.; and the inner from *b*. to *b*. Each heel will then present the appearance, shown in Fig. 3; and this is the shape, that every heel should have imparted to it, when it is first "cut off;" it should then be placed over the beak of the anvil, and hammered, until the point at *a*. disappears altogether, and the space between it and *b*. becomes a continuous portion of the rim, which is, what I mean by lengthening the outer edge of the shoe. This is more clearly shewn in Fig. 4, where *a*. *b*. mark the outer, and *c*. *d*. the inner rim.

Fig. 1.

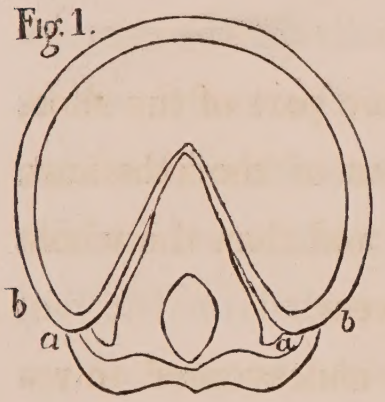


Fig. 2

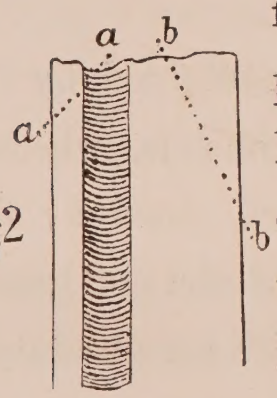
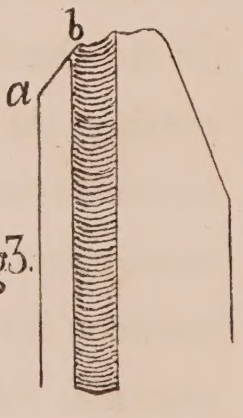


Fig. 3.



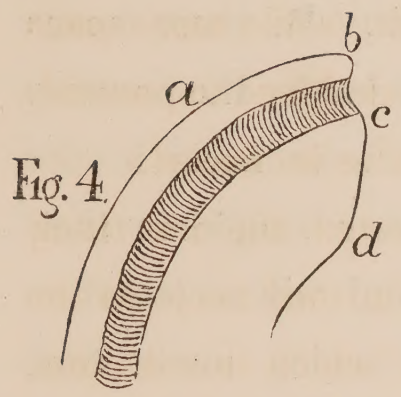


Fig. 4.

The next object of attention is the completion of the nail holes, which are usually left imperfect in a shoe, "turned in the rough:" but before doing so, it will be well to ascertain, that they fall in convenient places, where the horn is sound; and if they should fail to do so, others must be added. There is no fear of an extra hole or two materially weakening the shoe, even though they should chance to come near to each other; and the sacrifice of uniformity must not be considered in so important a matter, as keeping on a shoe.

We must now turn our attention to the fore part of the shoe, where a small, but stout, clip is to be formed out of the substance of the iron exactly in the centre of the toe; and then the whole width of the web turned up out of the line of wear.

The readiest mode of doing this I have endeavoured to represent by Fig. 5, where it will be seen, that the two limbs of

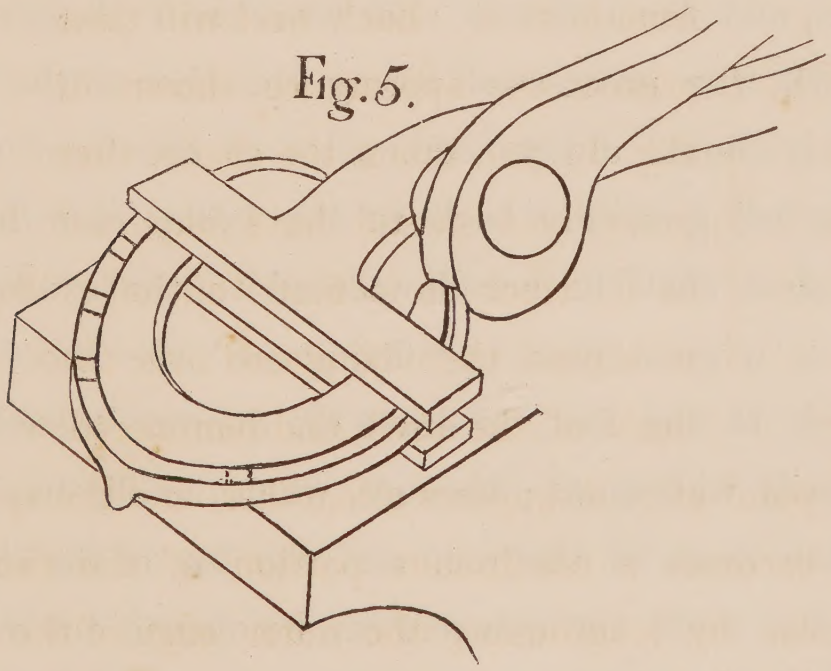


Fig. 5.

the shoe, the ground surface being uppermost, are grasped by tongs, prepared for the purpose, and the fore part of the shoe

made to project beyond the edge of the anvil. By these means any amount of elevation can be given to the toe by the hammer without altering the position of the quarters or heels in the smallest degree. These tongs, which are very simple in their construction, can be made by any smith, and will be found an useful addition to the tools in every forge, saving much time and trouble; for they not only enable the smith by the firm hold, they give him, of both limbs of the shoe at the same time to elevate the toe without distorting the remainder of the shoe, but also by turning it upon the anvil to restore the seating at the elevated portion, still preserving the form of the other parts: whereas the tongs in common use by acting upon one limb only at a time cause a series of displacements, each calling for immediate adjustment. The degree of elevation, imparted to the toe of the new shoe, should equal that of the old one, which it is destined to replace; and this can be readily ascertained by putting them side by side upon a flat surface. When this has been done, and the quarters and heels made plane with the face of the anvil, the process of fitting the shoe to the foot may be begun; this should always commence at the front of the foot, and be carried gradually back to the heels, care being taken, that the shoe shall be accommodated to the exact form of the hoof. It is a good plan in "fitting out" the shoe, preparatory to fitting it to the foot, to leave the quarters tolerably straight, and the heels wide apart; because, when the clip has been neatly let into the front of the toe, and the toe of the shoe carefully fitted to the hoof, the quarters can be opened out over the beak of the anvil, should they require it, and the heels brought in, without disturbing the toe; whereas straightening the quarters,

when they are too much rounded, and too wide for the foot, and opening the heels, when they approach too near each other, necessarily distorts the whole shoe, and interferes with those parts, which had been previously fitted, causing a needless waste of time and trouble.

It is absolutely essential in the course of this gradual fitting of the shoe, first to the toe, then to the quarters, and lastly to the heels, that it be applied to the foot sufficiently hot to scorch the horn, and show by blackened spots those portions of the crust, which are exposed to undue pressure. These spots must be removed by the rasp, as often as they shall appear, until the foot surface of the shoe is found to lie close to, and plane with the ground surface of the crust, which can be easily ascertained by cooling the shoe, and applying it to the foot with both hands, observing at the same time whether light can be perceived between the crust and the shoe; if not, the fitting is complete; but, if on the contrary streaks of light are observable, it is evident, that the contact is imperfect, and the crust bears unequally upon the shoe, which of course must be rectified, before the shoe can be nailed to the foot. The shoe having been properly fitted, should next be "back-holed," that is, have the holes on the foot surface enlarged, so as to allow a free passage to the points and shanks of the nails; this should always be done by breaking down the edge of each hole nearest to the outer rim of the shoe, which causes the upper part of the hole to incline outwards, and permits the point of the nail to come out low in the crust. The common practice is to break down the *inner* edge, which gives the hole an inclination inwards towards the centre of the foot, and obliges the nail to be driven high into the crust, before an outward direction can be given to the point; which is

always objectionable, in as much as it involves a risk of pressure from the shanks of the nails upon the sensitive parts immediately within the hoof, and causes an unnecessary destruction of horn from the splitting of its fibres by the nails, and the rasping of its surface, which follows.

The shoe, having been properly "fitted," and "back-holed," will require to be "filed up," that is, all the sharp edges and irregularities of surface removed by the file, particularly any burrs, which may present themselves about the nail holes. Finishing off the heels is an important part of filing up the shoe, and calls for special notice in this place.

It has been shewn in the body of the book, why the heels of the shoe should be brought round as close to the frog as possible; but as it is the ground surface only, which affords the protection so essential to this part of the foot, the remainder of the heel of the shoe, that is, its thickness, being not only useless, but positively in the way of the descent of the frog, should be bevelled off by the file in a direction upwards and outwards, as shewn in Fig. 6, which represents the heel of a shoe.—*a*. the seating, *b*. the flat surface for the crust and heel of the foot to bear upon, and *c*. the heel bevelled off, as recommended.

Fig 6.

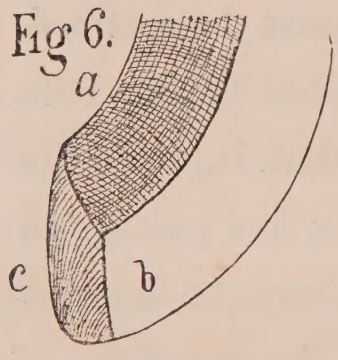
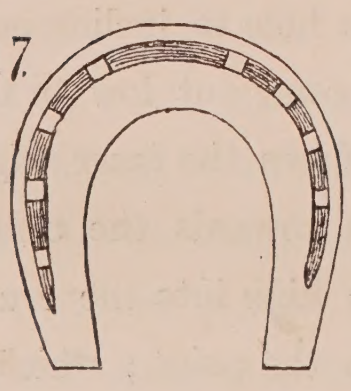


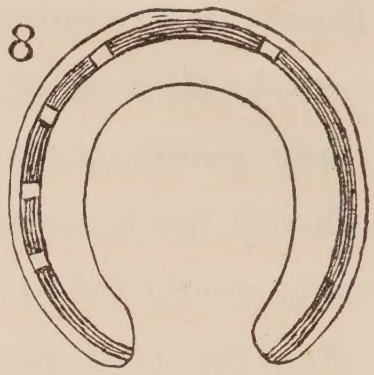
Fig. 7.



An almost universal prejudice prevails in favour of finishing off the heels of a shoe as square and angular, as a sharp file, firm hand, and correct eye can make them, as shewn in Fig. 7: but this I hold to be a very reprehensible practice, in as much as

edges and angles can do no good, and may prove a fertile source of evil by offering ledges for the hind shoe to catch upon. It is far wiser to remove them altogether, and present only rounded surfaces, as seen in Fig. 8, off which the hind shoe would most likely glance in case of accidental contact.

Fig. 8



I have often heard it objected, that, where it becomes expedient to insert leather between the foot and the shoe, it is not possible for five nails to retain it; but this is a false conclusion, drawn from the clumsy manner, in which the ends and edges of the leather are permitted to project beyond the shoe at the quarters and heels, as shewn in Fig. 9. Now if these unsightly projections formed any necessary part of shoeing with leather, or produced the smallest beneficial effect, there would be reasonable grounds for questioning the efficiency of five nails; but as they are only useless encumbrances, it follows, that any argument in favour of the necessity of more nails, founded upon their presence, must be altogether inadmissible, particularly when it is remembered, that the bare fact of the foot requiring leather at all implies, that it stands in need of the greatest freedom from restraint, which can be extended to it. I have made many experiments upon the subject, and am convinced, that, where the leather is cut to the exact shape of the shoe, and finished at the heels, as shewn in Fig. 10, the mere presence of the leather does not call for the employment of a single extra nail.

Fig. 9.

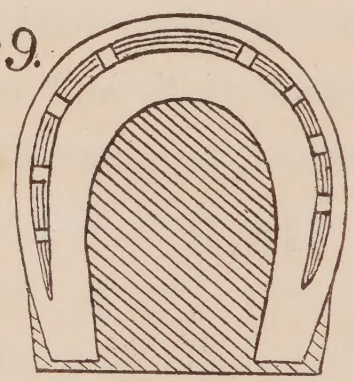
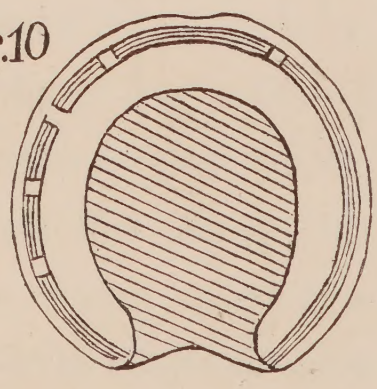
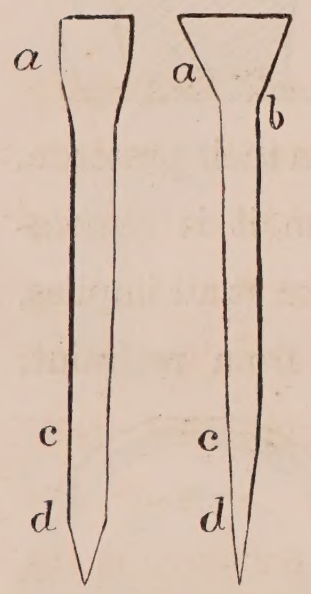


Fig. 10



The nails in common use are singularly defective in the qualities, best calculated to ensure the firmest hold for the longest period; their short triangular heads, angular shoulders, and long taper points all tend to diminish their power of holding a shoe, when it has been exposed to much wear, for, if the heads of the nails should fail to reach the bottom of the countersink, as is too often the case, the lower part of the holes will be unoccupied, except by the shanks of the nails, which of course cannot fill them; so that, long before the shoe is worn out, the heads of the nails will have disappeared, and the shoe be consigned to the very doubtful keeping of headless shanks. A nail, to be efficient, requires a head long enough to reach, and broad enough to fill, the bottom of the countersink, and a shoulder wide enough to block the opening, made in "back-holing" the shoe, and a shank of equal width and nearly equal substance throughout its whole extent, terminated by a short point.

Fig. 11



A comparison of these two descriptions of nails, as represented at *a*. *b*. *c*. & *d*. in Fig. 11., will demonstrate the very material difference, which exists between them; and the smallest reflection will show, wherein the one is superior to the other: for instance the head of the first will occupy every part of the countersunk nail hole, and its wedge-shaped shoulder will completely fill the opening on the foot surface; while the shank, from not being weakened by a long thin point, will form a broad firm clench, and thus the fastening will be as secure as possible: the second on the contrary is very likely to have the broadest part of its triangular head tightly

wedged in the upper portion of the hole, while its narrower base and shoulder remain, as it were, suspended in the lower portion, affording no assistance whatever towards keeping on the shoe; and, as the long fine point must of necessity produce a weak narrow clench, it is evident, that the continuance of the shoe on the foot will be of very doubtful duration.

In driving a nail care should be taken to give the point an *outward* as well as upward direction, so as to ensure its coming out again low down on the surface of the crust; it must then be cut off, leaving a short end to form a clench, and a notch made in the hoof by the edge of the rasp, deep enough to receive it, in which it should be buried by the hammer, and the rasp on no account be permitted to pass over it, after it has been once securely turned down; for the action of the sharp steel rasp upon the soft iron clench, however lightly it may be applied, is almost sure either to cut it through entirely, or, what amounts to the same thing, weaken it so much, as to render it very insecure; and this is a common cause of shoes being cast.

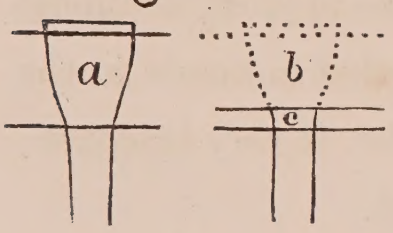
The only reason, which I have ever heard assigned, for rasping the clenches is the air of careful finish, which it gives to the foot, implying that nothing has been neglected, or overlooked: but, if the essentials have been attended to, this ill-judged finish may very well be dispensed with, especially as the first dirt, the horse steps into after quitting the forge, will dispose of all, that is ornamental about it, and leave only the *insecurity*, to mark the difference between clenches, that have thus been polished by the rasp, and those, which have been merely turned down by the hammer.

Having shewn, in what manner a shoe should be attached to the

foot, I may perhaps be excused for adding a few passing remarks upon the causes, which sometimes prematurely displace it; and also upon the unphilosophical and cruel practice, which has immediate recourse to extra nails, as the only effectual remedy against the recurrence of the evil; whereby the poor beast is made to atone by pain and suffering for the negligence and ignorance of those, whose bounden duty it is in return for his valuable services to minister to his comfort, and shield him from harm.

Whenever a shoe has been *properly fitted to the foot*, and secured by five well formed nails, driven into sound horn, and firmly clenched down, it is impossible for it to be cast, except as the result of most reprehensible negligence in leaving it on, until the nail heads have been worn away; when indeed it would be a miracle, if it did not come off. Fig. 12. will show the effect of this undue wear upon the nail better, than words can describe it.—*a.* represents the nail, when it is first driven into the shoe; and the lines above and below it mark the thickness of the shoe itself. The dotted lines around *b.* show the portions of the nail and shoe, that have been destroyed by wear; and *c.* shows the thickness of the worn out shoe, with all, that remains of the nail, to hold it to the foot.

Fig. 12.



The unsupported assertion, that this mode of shoeing may answer for one sort of work, or one kind of ground, but not for others of a different description, cannot stand for a moment against the facts above cited; to which I may add, that a leader in the fast mail has been working for the last month with three nails only in each of his fore shoes: but it is needless to multiply cases in proof of a position, which is established beyond all dispute: there-

fore, whenever a shoe happens to be cast, we should use our utmost endeavour to fix it upon the particular blunder, fault, or carelessness, that may have caused it; and not heedlessly visit it upon the poor unoffending horse, when it clearly attaches either to the carelessness of the smith, or the negligence of the groom; for to one or other of these causes every cast shoe may be traced: either *it did not fit the foot;* or *it was too long;* or *the clenches were cut off* in rasping the foot; or it was not removed *in proper time;* or it was *entirely worn out.* The barbarity of attempting to meet any of these circumstances by placing nails in a part of the shoe, where there is less friction to destroy their heads, but where their presence inflicts torture upon the horse, every time he moves, is as irrational and cruel, as it would be to permit nurses to cram children's feet into very tight shoes, to save the trouble of supplying new strings, when the old ones break, or wear out. These things should not be; and it behoves every horse-master to take the very small trouble of seeing for himself, that they no longer remain so; for a merciful man is merciful to his beast.

THE END.

POLLARD, PRINTER, EXETER.

Fig. 1.

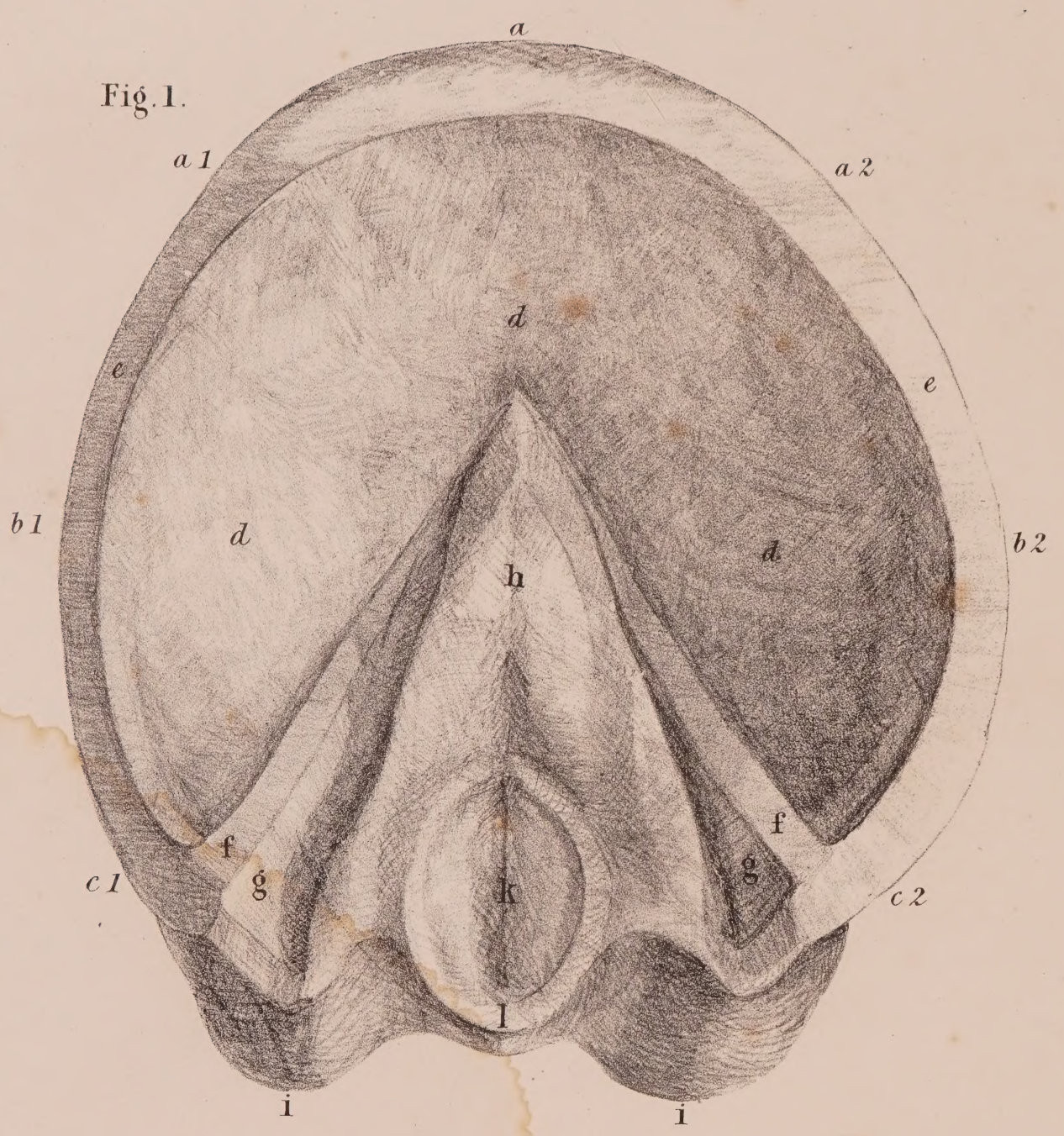
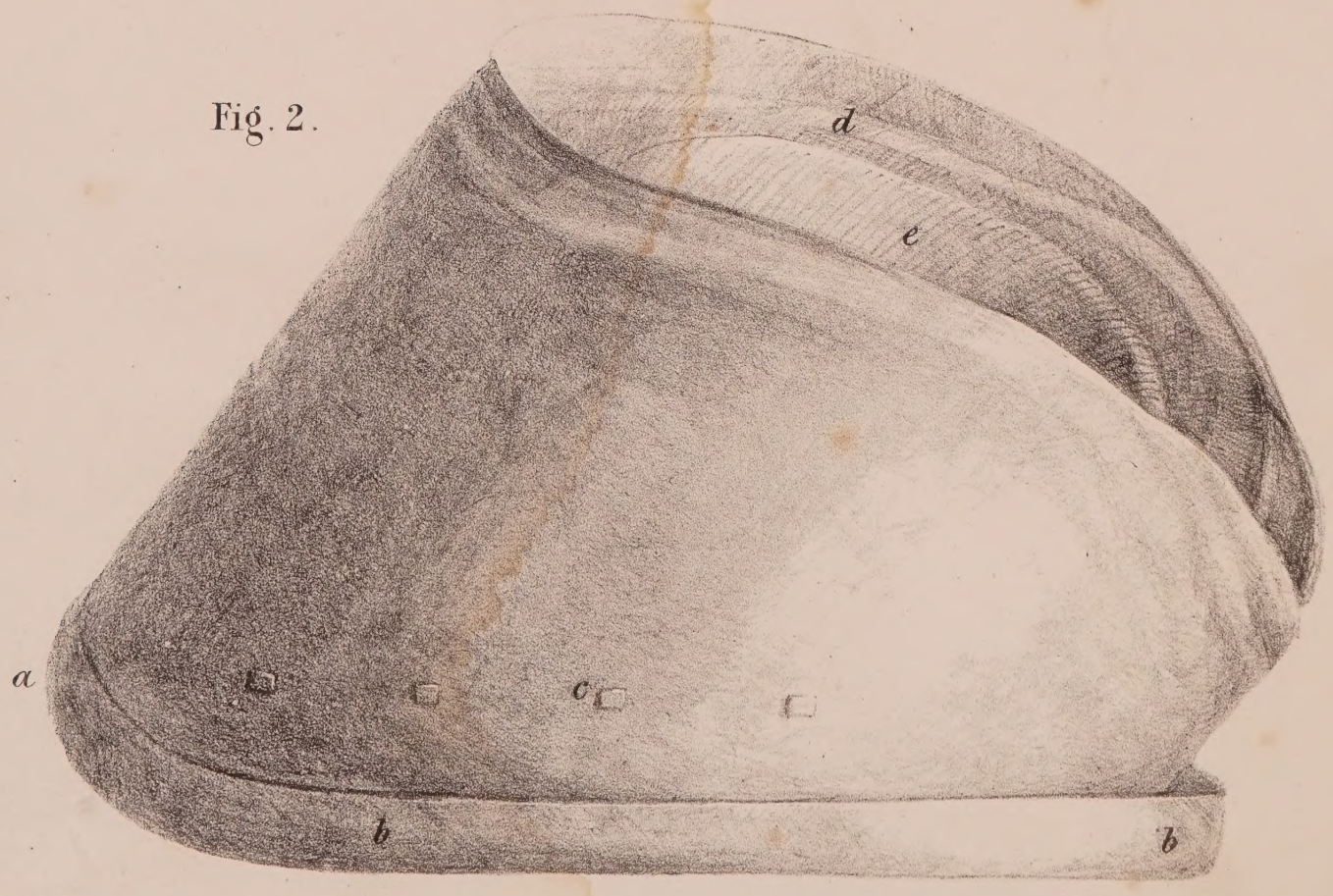


Fig. 2.



On Stone by W. Miles Esq.r

Printed by C. Risdon, Exeter.

Plate I.

Represents the left or near fore foot of a pony five years old, which was destroyed in consequence of an accident. It had been but a few times shod, and is a very good example, of what may be called a perfect foot.—I have drawn it of the exact size of the original, and carefully preserved the relative position of the various parts to each other.

Fig. 1.—Shows the ground surface of the hoof prepared for receiving a shoe ; and marks very distinctly the difference between the curvature of the outer and inner quarters.—

a The toe—rasped away to receive the turned up shoe.
a 1. The *inner* toe.
a 2. The *outer* toe.
b 1. The *inner* quarter.
b 2. The *outer* quarter.
c 1. The *inner* heel.
c 2. The *outer* heel.
d d d. The sole.
e e. The crust or wall of the hoof.
f f. The bars.
g g. The commissures.
h k l. The frog.
h. The part immediately under the navicular joint.
k. The oval cleft of the frog.
l. The elevated boundary of the cleft.
i i. The bulbs of the heels.

Fig. 2. Shows the outer side of the same foot with a shoe attacned :— It also partially shows the interior of the hoof, which is more fully represented in Plate 10.

a. The toe of the shoe turned up out of the line of wear.
b b. The shoe represented of the same thickness from toe to heel.
c. The clenches.
d. The hollow for receiving the coronary substance, which secretes the horn.
e. The thin horny plates, that line the wall of the hoof.

pl. 3

PLATE 2.

Fig. 1.

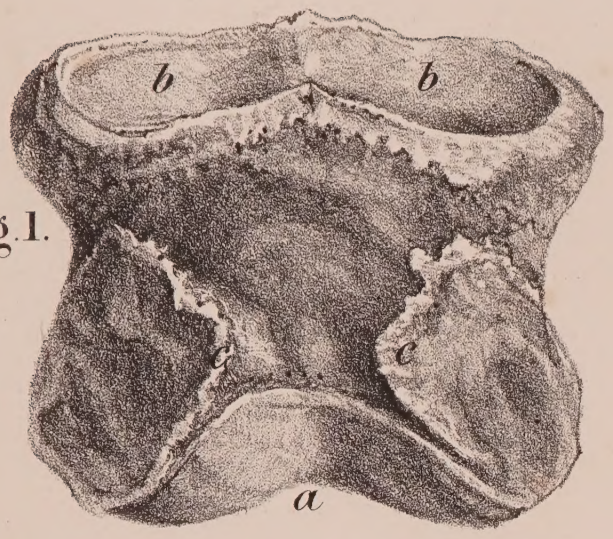
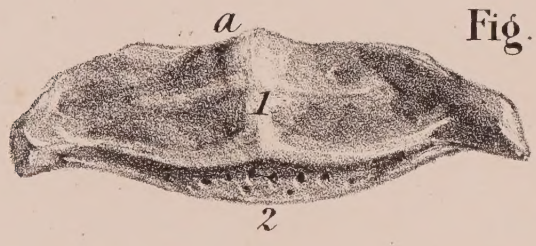


Fig. 2.

Fig. 3.



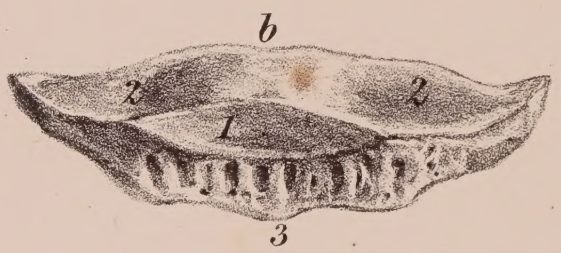
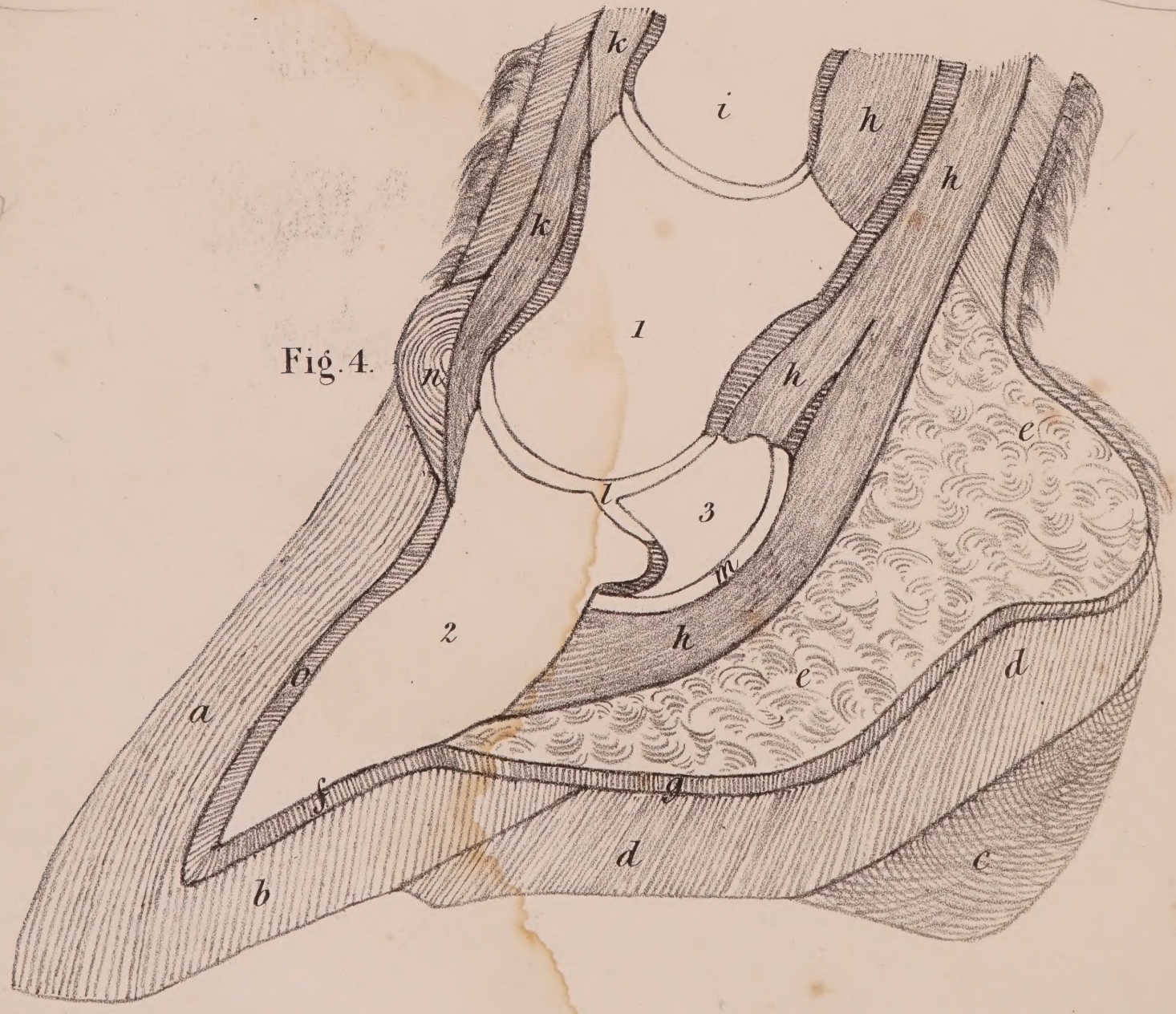


Fig. 4.



pl. 2

pl. 3

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Plate II.

Represents the detached bones of the foot, and also a section of the foot, exhibiting at one view the relative position of all its parts in the way of a map: the former I drew from the bones of the foot, represented in Plate I,—and the latter from the foot of a young thorough bred horse, rising four years old, in which shoeing and stabling had not had time to produce any material changes.

Fig 1.—The coronet bone.

a. The under surface, which forms part of the coffin joint.

b. The upper surface, which forms part of the pastern joint.

c. Roughened surfaces for the insertion of muscles.

Fig. 2—The coffin bone.

a. The toe;—showing its elevation from the ground line of the sides of the bone, as also its notched appearance.

b. b. The wings.

c. c. Holes for the passage of the arteries, which supply the sensible covering of the bone and the bone itself with blood.

d. d. Surfaces, which form part of the coffin joint.

e. The body of the bone much roughened for the attachment of the sensible laminæ, and thickly studded with holes for the passage of blood vessels.

Fig. 3.—Two views of the navicular bone.

a. The under surface.

1. The surface which forms,—with the tendon passing under it,—the navicular joint.

2. A roughened surface for the insertion of a tendon.

b. The upper surface.

1. The surface, by which the navicular bone is joined to the coffin bone.

2 2. The surface, which forms part of the coffin joint.

3. A deeply roughened surface for the attachment of the strong ligament, that binds the navicular to the coffin bone.

Fig. 4.—A section of the foot.

1. The coronet bone.
2. The coffin bone.
3. The navicular bone.

a. The wall.

b. The sole.

c. The cleft of the frog.

d d. The frog.

e e. The fatty frog or elastic cushion.

f. The sensitive sole.

g. The sensitive frog.

h h h. Tendons of the muscles, which bend the foot.

i. Part of the pastern bone.

k k. Tendons of the muscles, which extend the foot.

l. The coffin joint.

m. The navicular joint.

n. The coronary substance.

o. The sensible laminæ, or covering of the coffin bone.

PLATE 3.

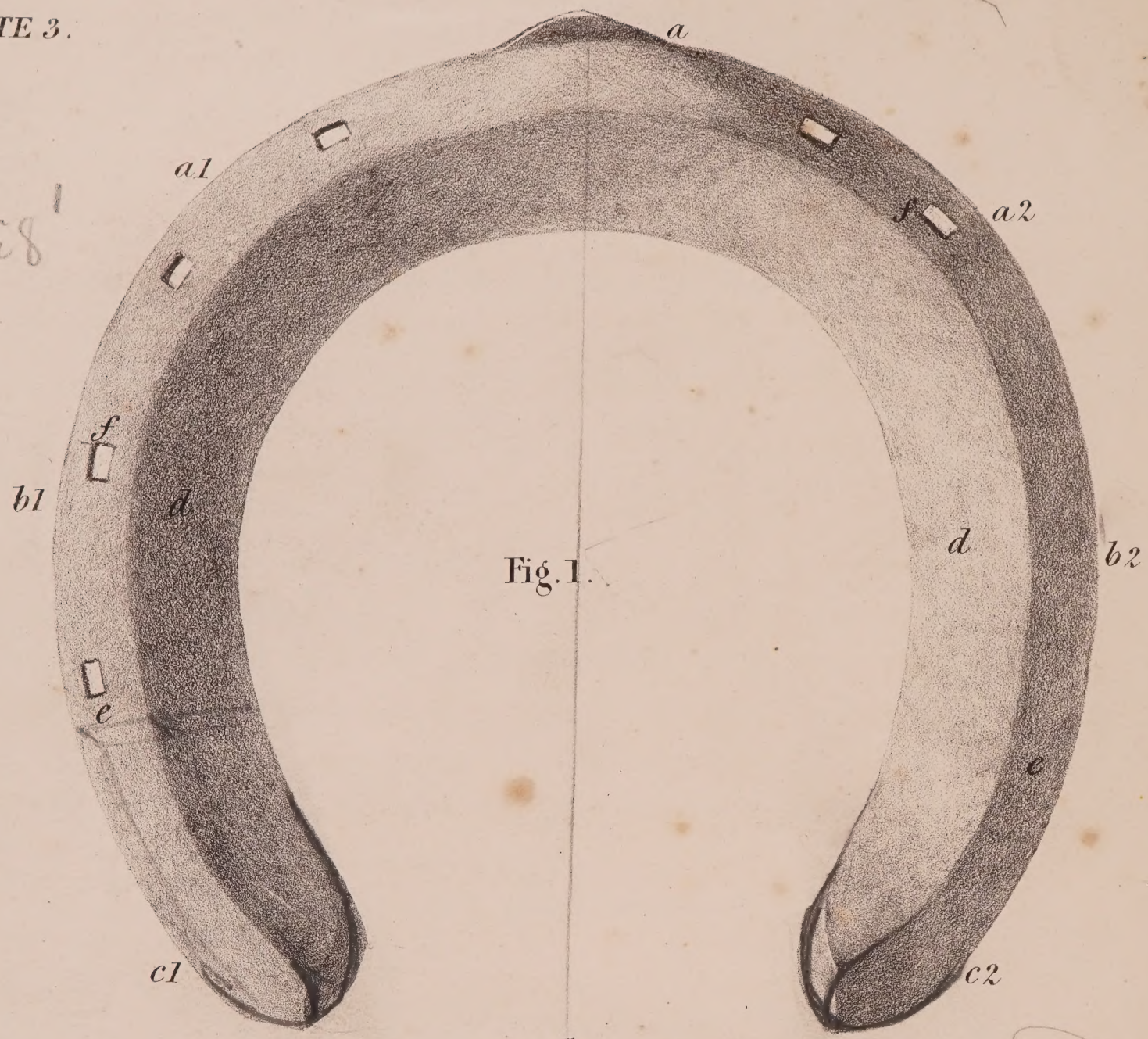

Fig. 1.

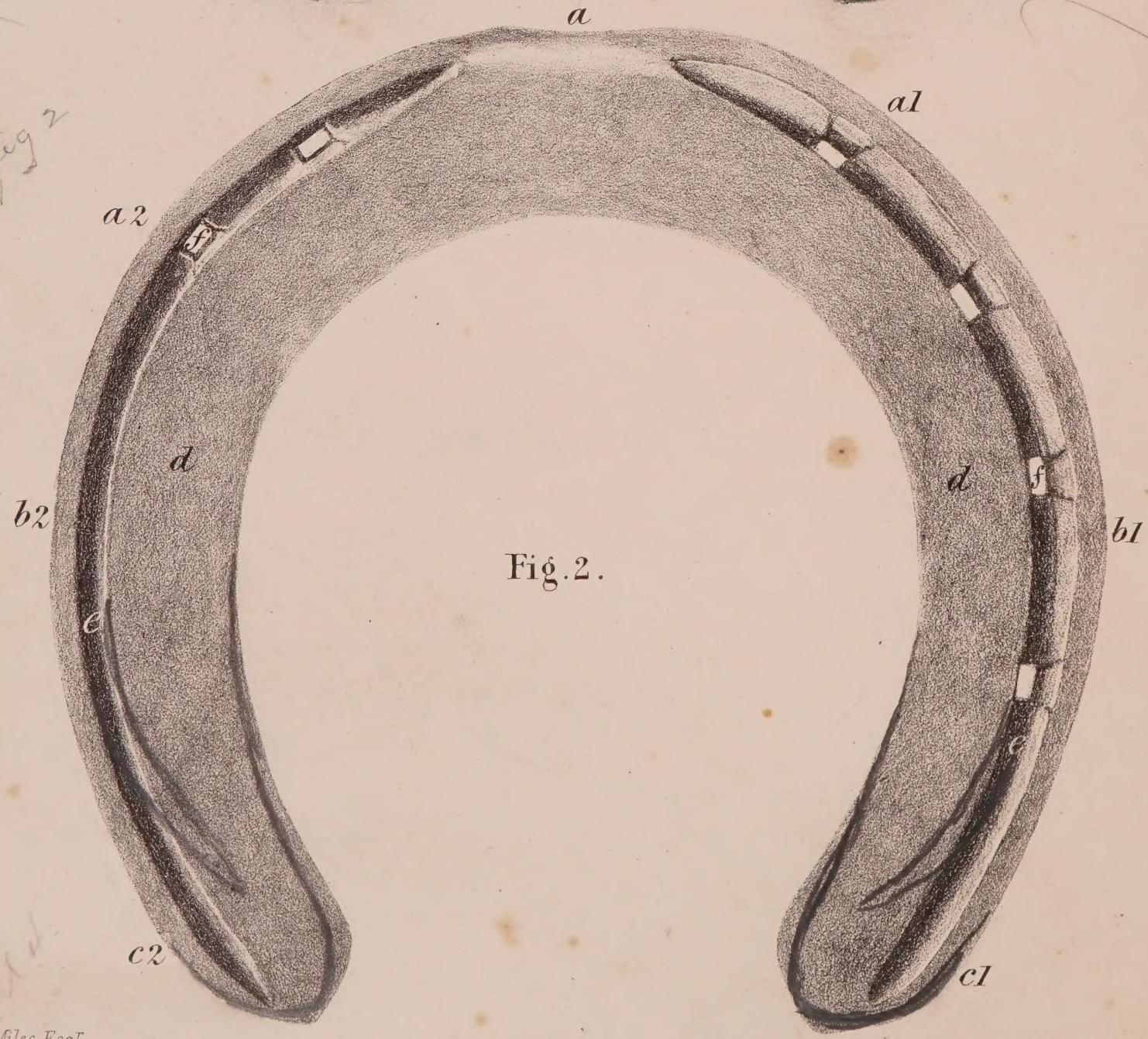

Fig. 2.

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Plate III.

Represents the upper and under surfaces of a near fore shoe: I have drawn them after the manner of a plan, fearing that a perspective representation of thickness might possibly mislead.

Fig. 1. Shows the upper or foot surface.

a. The clip at the toe.

a. 1. The *outer* toe.

a. 2. The *inner* toe.

b. 1. The *outer* quarter.

b. 2. The *inner* quarter.

c. 1. The *outer* heel.

c. 2. The *inner* heel.

d d. The seating.

e e. The even surface for the crust to bear upon.

f f. The nail holes.

Fig. 2. Shows the under or ground surface.

a. The toe turned up out of the line of wear.

a 1. The *outer* toe.

a 2. The *inner* toe.

b 1. The *outer* quarter.

b 2. The *inner* quarter.

c 1. The *outer* heel.

c 2. The *inner* heel.

d. d. The web.

e. e. The fullering.

f. f. The nail holes.

PLATE 4.

Fig. 1.

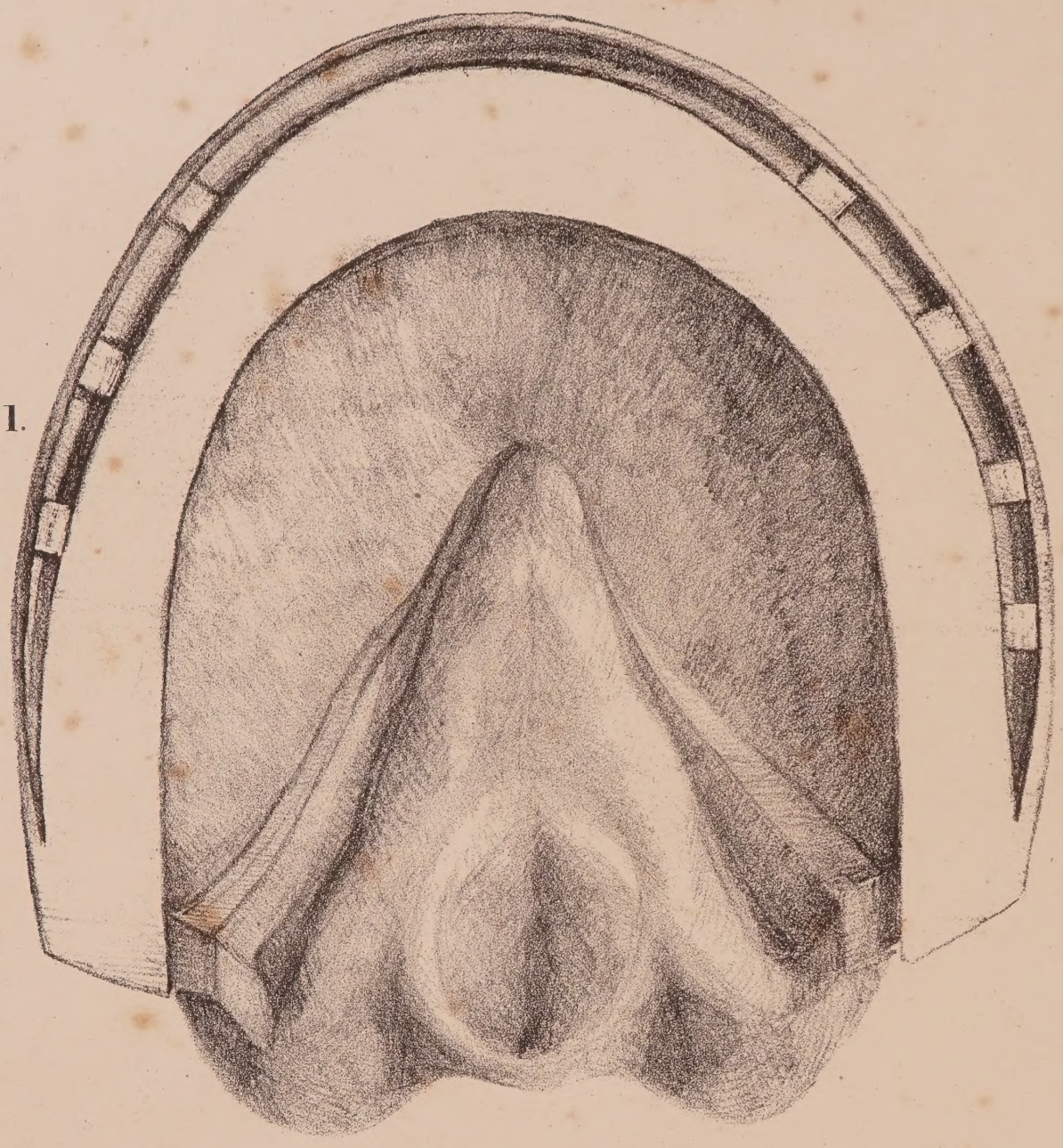

Fig. 2.

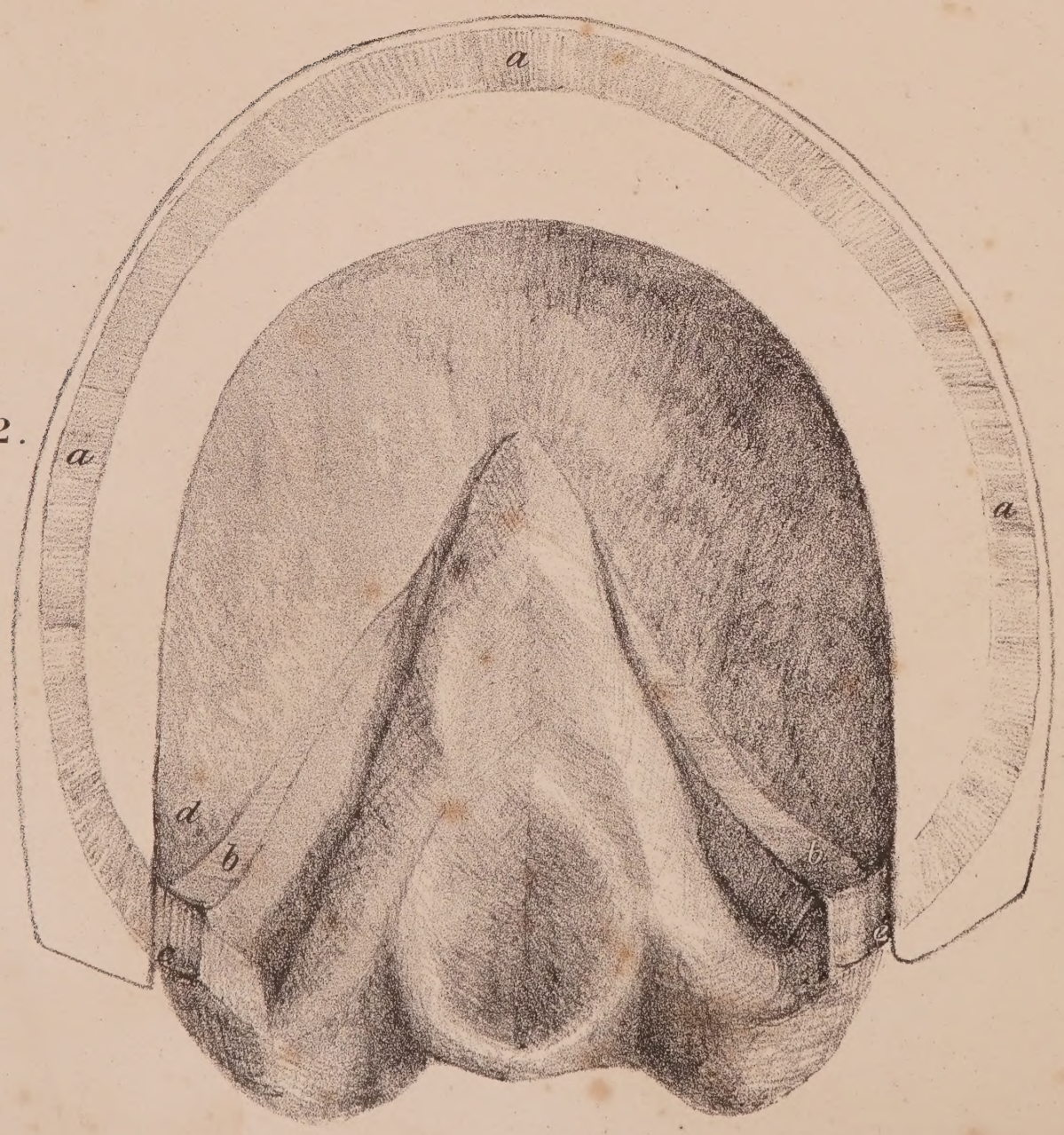

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Plate IV.

Represents a near fore foot, shod on the objectionable plan of having the shoe "well set off at the heels."

Fig. 1.—Shows this mode of shoeing, as it is usually practised;—with the web at the heels only about half as wide as at the toe;—the heels so far separated, as to deprive the important parts, lying between them, of all protection;—and the shoe held on by seven nails, placed principally in the quarters.

Fig. 2.—Represents the same foot with the shoe rendered transparent,—showing the very small and unimportant portion, that receives protection, compared with the large and important portion, which is left exposed to all kinds of injury.

a a a. The crust seen through the shoe.

b b. The bars completely exposed.

c c. The outer edge of the crust, bearing upon the inner edge of the shoe.

d. The situation of corns entirely unprotected.

It will be observed, that the heels of the shoe afford neither support nor protection to any part of the foot; and that, if the inner side from just above where the reference Fig. 2 happens to come, back to the heel,—be left thus projecting, the horse will be very apt, in passing over rough ground, to place the other foot upon the projection, and tear off the shoe.—The edge of the shoe should everywhere correspond to the edge of the crust.

PLATE 5.

Fig.1.

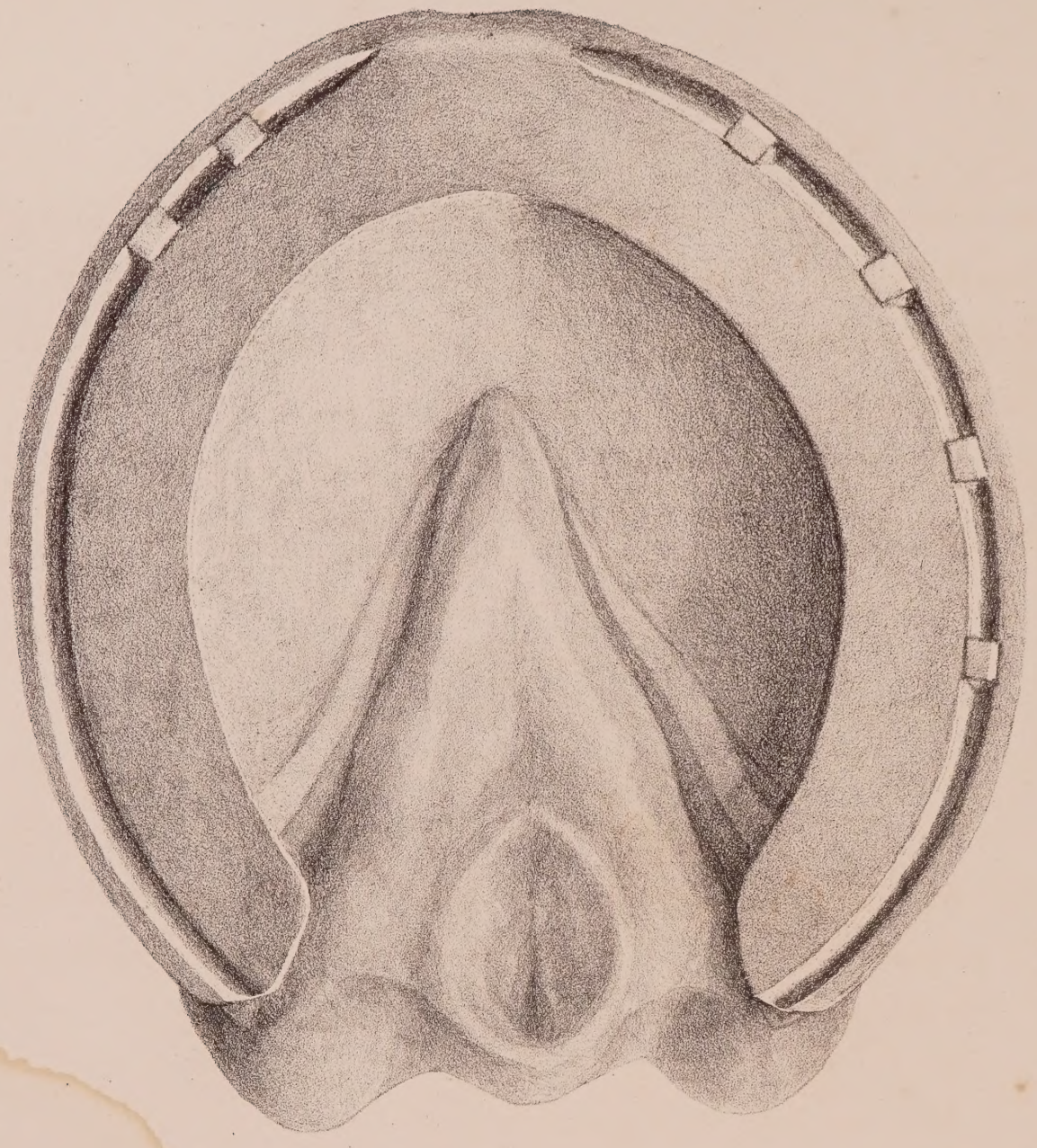
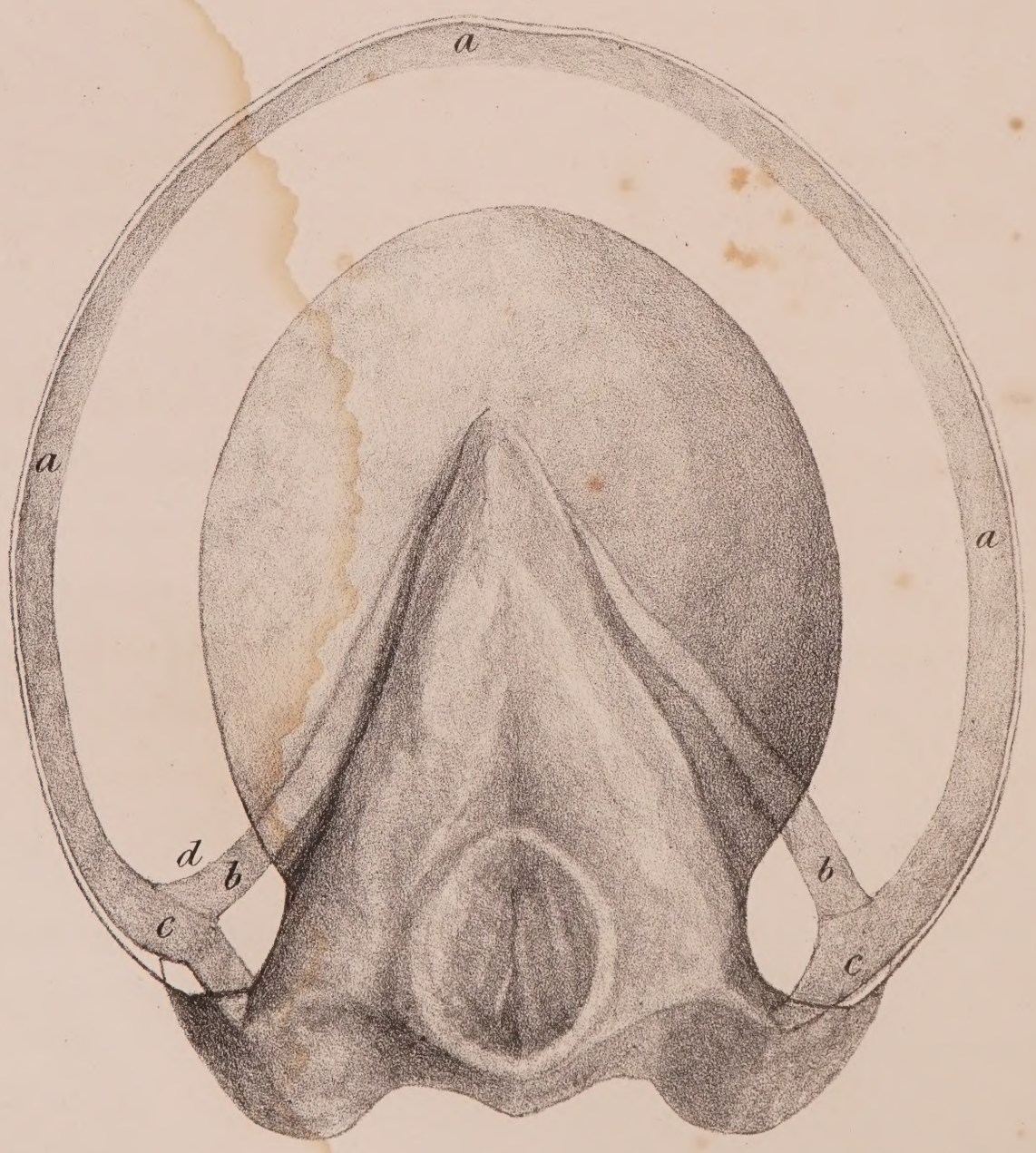


Fig.2.



On Stone by W. Miles Esq^r

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Plate V.

Represents the same foot as Plate IV, but shod upon a plan, which interferes less with the natural action of the various parts of the foot, than any other, that has ever been suggested, and therefore most strenuously to be recommended.

Fig. 1.—Shows a shoe so applied—the web at the heels is as wide as at the toe:—the heels are brought in, so as just to clear the frog, and defend the foot, as much as possible, against injury:—the toe is turned up out of the line of wear:—the fullering is carried back to the heels,—and the nails placed four in the outer, and two in the inner side of the shoe.—I carry the system a little further with my own horses; and omit the second nail on the inner side,—employing only five altogether.

Fig. 2.—Represents the same foot with the shoe rendered transparent, showing what parts of the foot are covered, and protected by bringing in the heels of the shoe.

a a a. The crust with the shoe closely fitted all round.

b b. The bars, protected by the shoe.

c c. The heels, supported by the shoe.

d. The situation of corns protected from injury.

If we compare Fig. 2 of this Plate with Fig. 2 of the preceding, we shall be struck with the disproportion in the utility of the two shoes, as defences for the horse's foot.

In the one just described every atom of the shoe is made available for support or protection; while in the other a very considerable portion is not only utterly wasted, by being thrust out beyond the hoof, but is actually converted into a source of evil,—receiving—on the inner side the occasional tread of the other foot,—on the outer that of another horse,—and on both—resistance to the withdrawal of the foot out of stiff ground, thereby risking the shoe being dragged off:—for when the shoe projects

beyond the crust it makes an opening larger than the foot can fill, and the clay curling over the ledges which are formed by the projecting portions of the shoe, offers a resistance to its return exactly proportioned to the depth to which it may have sunk into the ground:—but where the shoe has been accurately fitted the weight of the horse expanding the foot while it is still in the ground enlarges the hole, and makes a free passage for the return of the shoe.

Again—on comparing the parts marked *b. c. d.* in both feet with each other, we shall find them in one—defenceless and exposed; while in the other they are securely sheltered by a bar of iron;—which bar of iron, by its near approach to its neighbour, often saves the foot from alighting upon a stone with a violence, that would thrill through horse and rider.

PLATE 6.

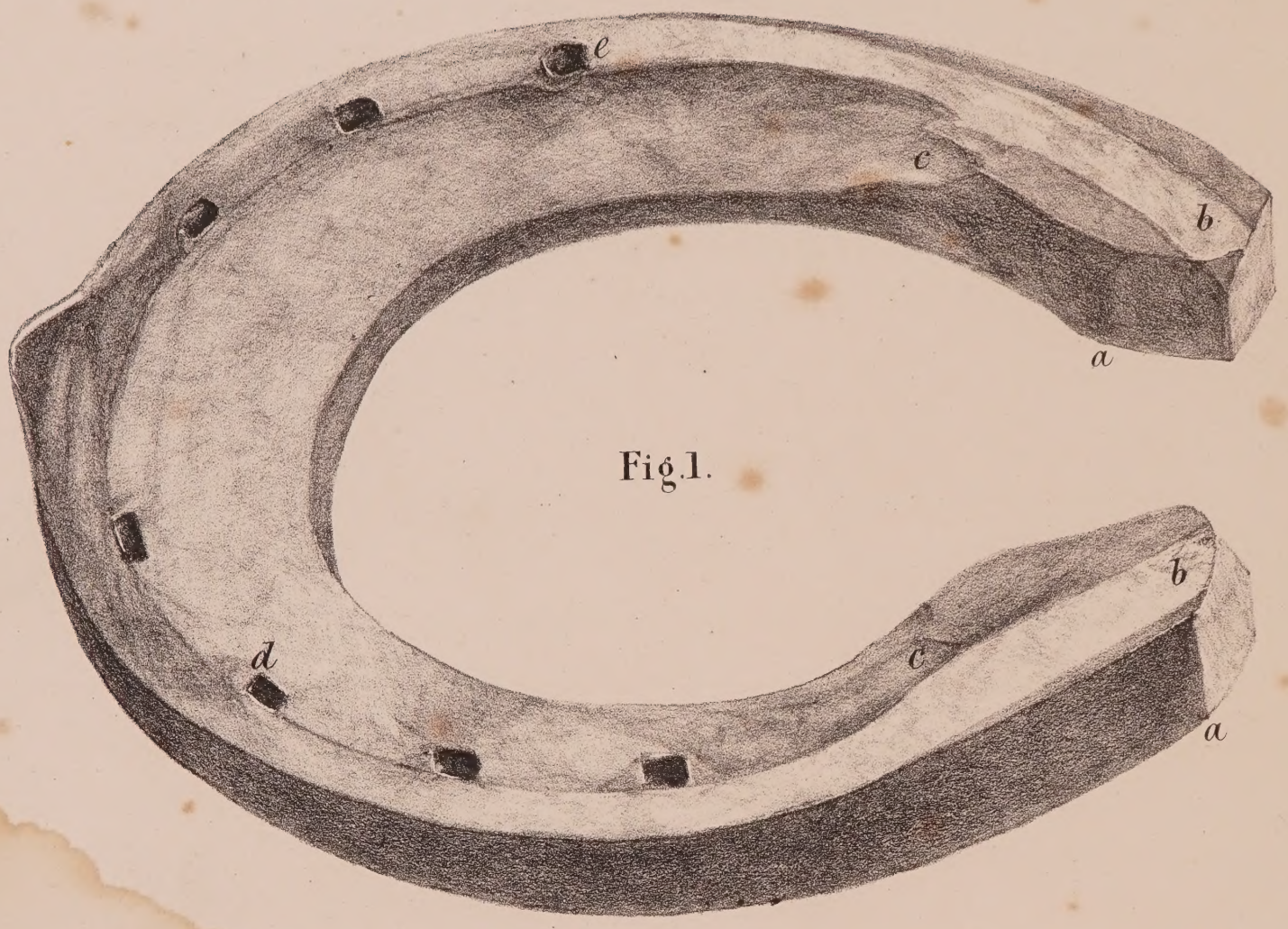

Fig. 1.

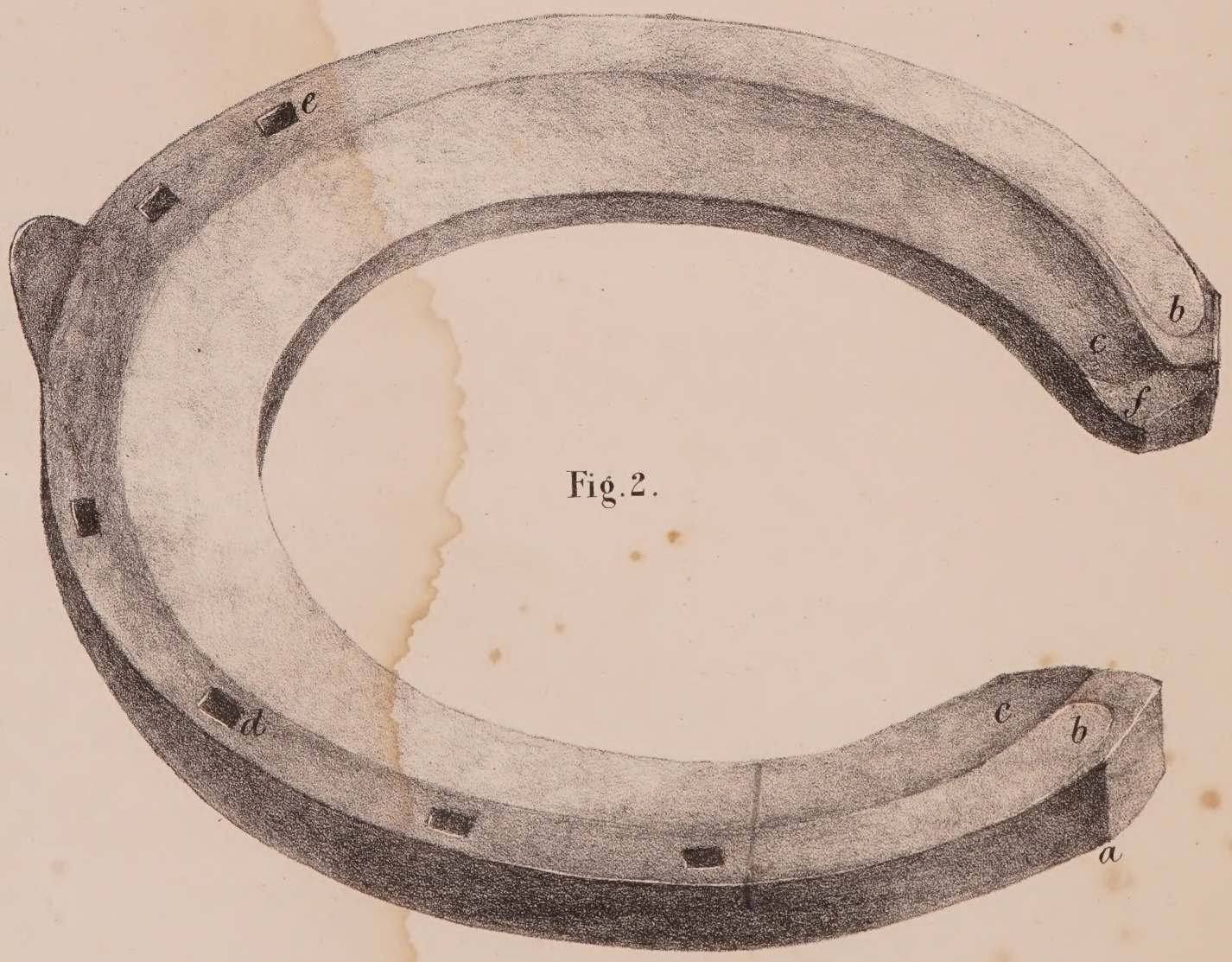

Fig. 2.

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Plate VI.

Represents two near fore shoes, removed from the same horse at different times: the first, which is full of defects, was replaced by the second, which is entirely free from them.

Fig. 1. Is the portrait of as faulty a shoe, as could be met with,—whose glaring defects we will endeavour to turn to a useful account by considering them first in detail, and then in comparison with Fig. 2, where they have been corrected.

a. a. The heels,—showing that the shoe becomes thicker and thicker, as it proceeds backwards, until it forms a perfect wedge, the base of which is fully double the thickness of any other part of the shoe.

b b. Show the marks of the crust, bearing upon the shoe; and prove, by the absence of a defined termination, that the shoe was too short for the foot, and had not reached to the heels of the hoof.

c c. The seating—discontinued just where its presence was most required, and a mass of iron left to project into the angles at the heels, where pressure should be particularly avoided, as conducing to corns.

d. Four of the nail holes, punched entirely in the seating, instead of in the flat surface around the shoe.

e. The last nail hole on the inner side, placed so far back in the quarter, as to prevent the possibility of the foot expanding.

Fig. 2.—Is the portrait of the shoe, which replaced Fig. 1.

a. The heel of an even thickness with the rest of the shoe.

b b. Show the points, at which the heels of the hoof terminated.

c c. The seating carried back, so as to clear the angles at the heels, and leave the seat of corns free from pressure.

d. The nail holes placed in the flat surface, which supports the crust, where they should always be.

e. The hindermost nail of the inner side at the inner toe, whereby the whole of the quarter and heel are left free to expand.

f. The corner of the shoe bevelled off to make room for the frog.

PLATE 7.

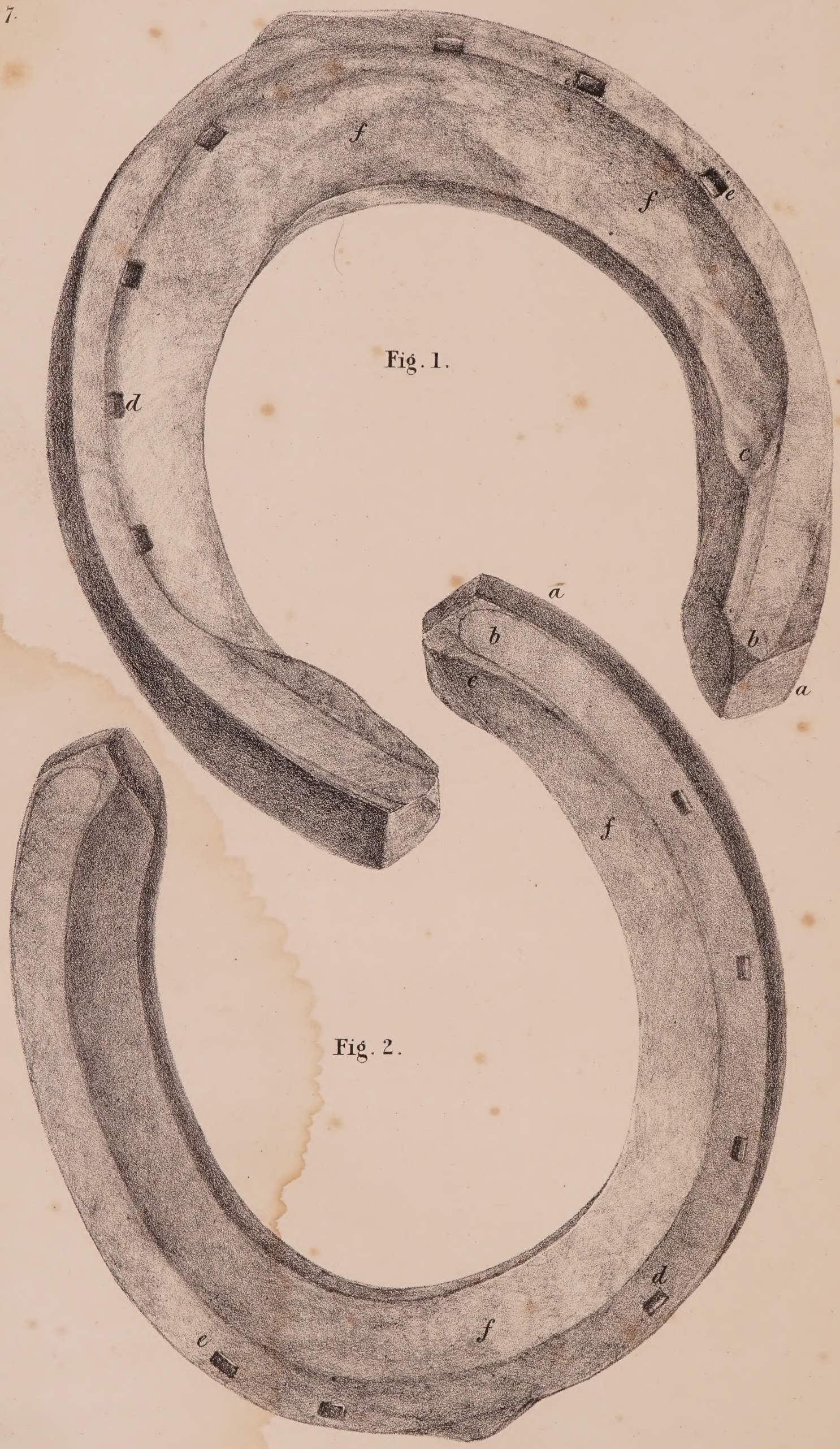


Fig. 1.

Fig. 2.

On Stone by W. Miles Esq.

Printed by C. Rusdon, Exeter.

Plate VII.

I consider myself particularly fortunate in having obtained the shoe, from which Fig. 1 in this and the preceding Plate has been drawn; seeing that it presents an illustration of nearly every defect a shoe could possess, without one redeeming quality to recommend it. I have been tempted to add another view of it, because it enables me to show some of these defects to greater advantage, than I could contrive to do in Plate 6.

Fig. 1 *a*. The thick wedge shaped objectionable heel.

b. The mark made by the bearing of the crust, showing that the shoe had not extended far enough back to support the heel.

c. The termination of the seating, and commencement of the mischievous projection of iron.

d. The nail holes punched in the seating, where they ought not to be.

e. The flat surface, whereon the crust ought to have had an even bearing all round the shoe, and in which the nail holes should have been punched: we shall however find, upon comparing this surface with the width of the marks of the crust at *b*, that it is everywhere narrower than the crust to be supported by it; so that the whole weight of the horse must have been sustained by the outer half only of the crust; the inconvenience of which would be greatly aggravated by the four holes of the outer side being placed in the seating, causing a considerable strain upon the nails, whenever the weight was thrown upon the outside of the foot, as it would be in turning to the left.

f f. The seating every where overdone, excepting at the heels, where it was most wanted; and there it is discontinued altogether. When a shoe is too much hollowed by seating, it defeats its own object by leaving space enough for a body of dirt, or even small stones, to work in and become imbedded between the foot and the shoe, resisting the descent of the

sole as effectually, as an unseated shoe would do. Sufficient space to admit the point of a picker to pass freely all around between the shoe and the foot is all that is necessary.

The web of the shoe, it will be observed, is just twice as wide at the toe, where the cover might well have been spared, as it is at the heels, where protection was most desirable.

Fig. 2 *a*. The heel of an even thickness with the rest of the shoe.

b. The mark of the crust with the termination well defined, shewing that the heel had been supported.

c. The seating carried through to the heel.

d. The nail holes properly placed.

e. The flat surface of sufficient width everywhere to support the crust.

ff. The seating less hollowed than in Fig. 1, and the web of equal width at the toe and heel.

The shoe Fig. 1, I found upon the foot of a horse, which I purchased for a friend about two years ago; and it is worthy of remark, that it was placed there by a smith, who enjoys in a very extensive district the reputation of being a particularly good shoer. If gentlemen could only be persuaded to inform themselves sufficiently to give their directions with the confidence, that a knowledge of the subject is sure to engender, and to *know*, when the work is finished, whether those directions have been complied with, they would drive such men as these from their lamentable ignorance of the first principles of their art into something like a rational view of the subject: but where gentlemen are contented to remain without knowledge, smiths may be excused for not informing themselves.

PLATE 8.

Fig. 1.

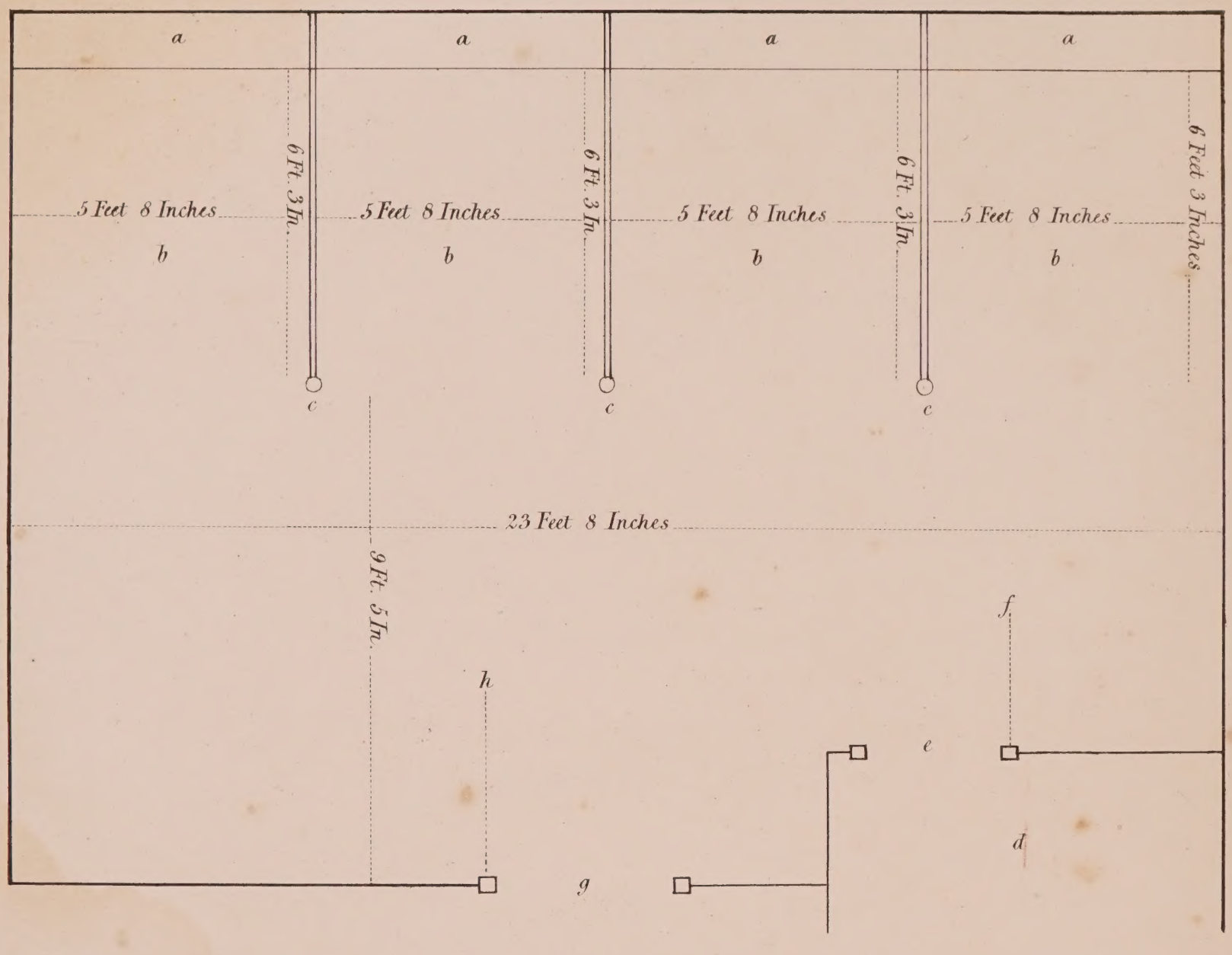
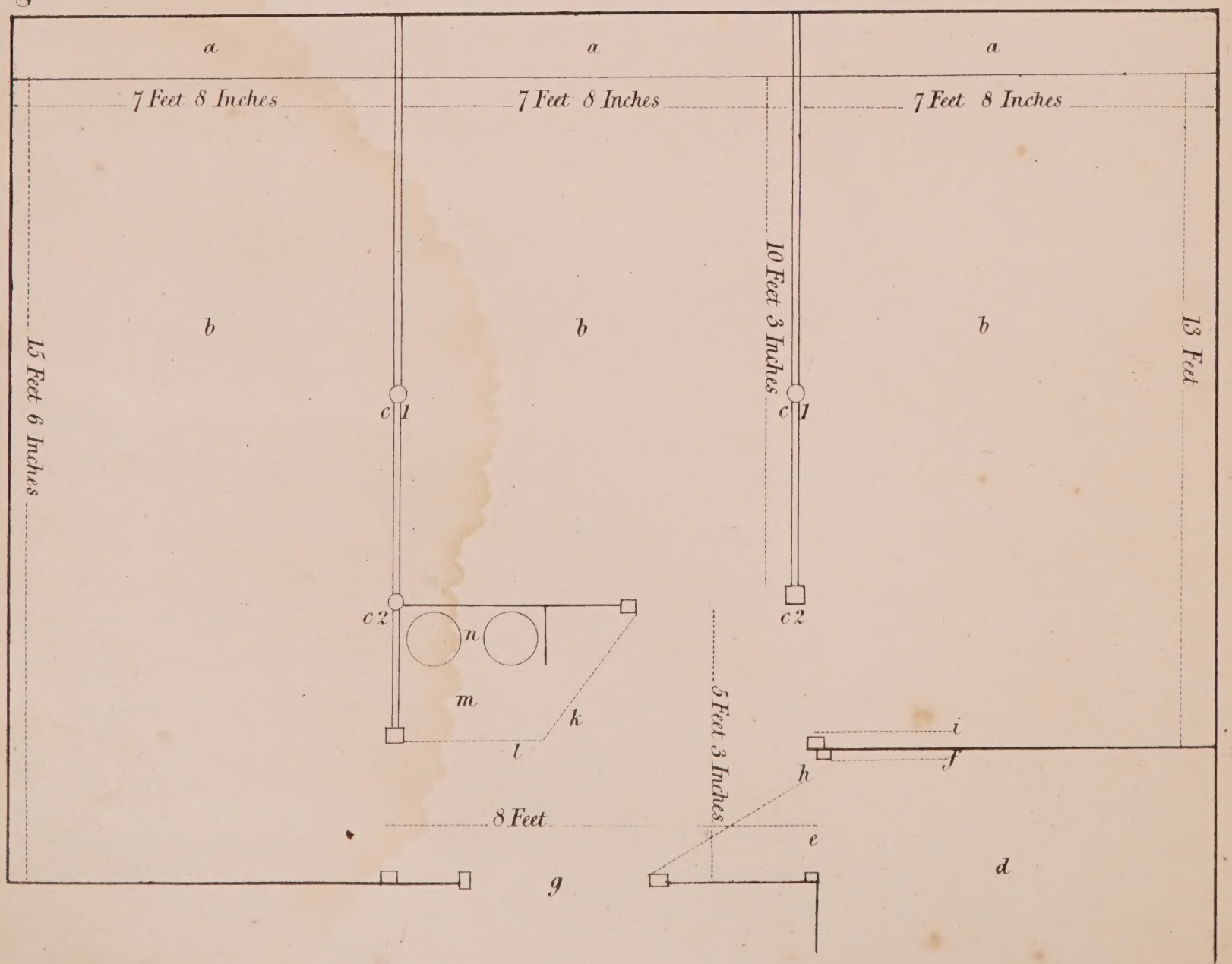


Fig. 2.



C. Risdon, litho. Exeter.

Plate VIII.

Represents the plan, upon which I have lately converted a four stalled stable into three loose boxes; and shows that the space gained for the use and comfort of the horses, is considerably more than doubled.

Fig. 1. Shows the space as originally laid out for a four stalled stable.

a. The manger in each stall.

b. The stalls.

c. The heel posts.

d. Part of the saddle room.

e. The door way from the saddle room to the stable.

f. The door opening towards the stable.

g. The entrance to the stable.

h. The stable door opening from right to left.

Fig. 2. Shows the same space turned to the best account for the horses.

a. The manger undisturbed.

b. The boxes.

c 1. The original partitions and heel posts of the stalls shifted bodily.

c 2. The additional heel posts: the upper part of the partition extending from *c.* 1, to *c.* 2 in each box, is composed of iron railing, which enables the horses to see each other.

d. Part of the saddle room.

e. The position of the door way changed, so as to prevent the loss of space occasioned by the door opening towards the stable.

f. The door opening back into the saddle room, where it is out of the way.

g. The entrance to the stable.

h. The stable door hung to the opposite post, by which arrangement whenever it is opened it is made to close the entrance to the saddle room, and prevent the possibility of the horses passing into it instead of the boxes.

i. The door of the box, opening inwards so as to place it out of the way.

k & l. The doors of the other two boxes, opening outwards so as to meet, and enclose a space behind them.

m. The space so enclosed, receiving two buckets, a shovel, broom, dung fork, and basket.

n. The two buckets, and above them a seat, which acts as a shelf to deposit any thing upon.

By this disposition of the space the horses receive the full benefit of every available atom of it, and instead of there being a waste of 23 feet 8 inches, by 9 feet 5 inches, there is positively none at all; for the 8 feet, by 5 feet 3 inches, unappropriated to the use of the horses, is not more than is required for a free passage into the boxes, and the reception of the necessary stable implements. The doors which in Fig. 1 entail a waste of half a large circle of space in the opening and shutting, are so arranged as only to traverse the space necessary for the passage, and when open, to form sides to it, and become useful in directing the horses in and out of their respective boxes.

PLATE 9

Fig. 1.

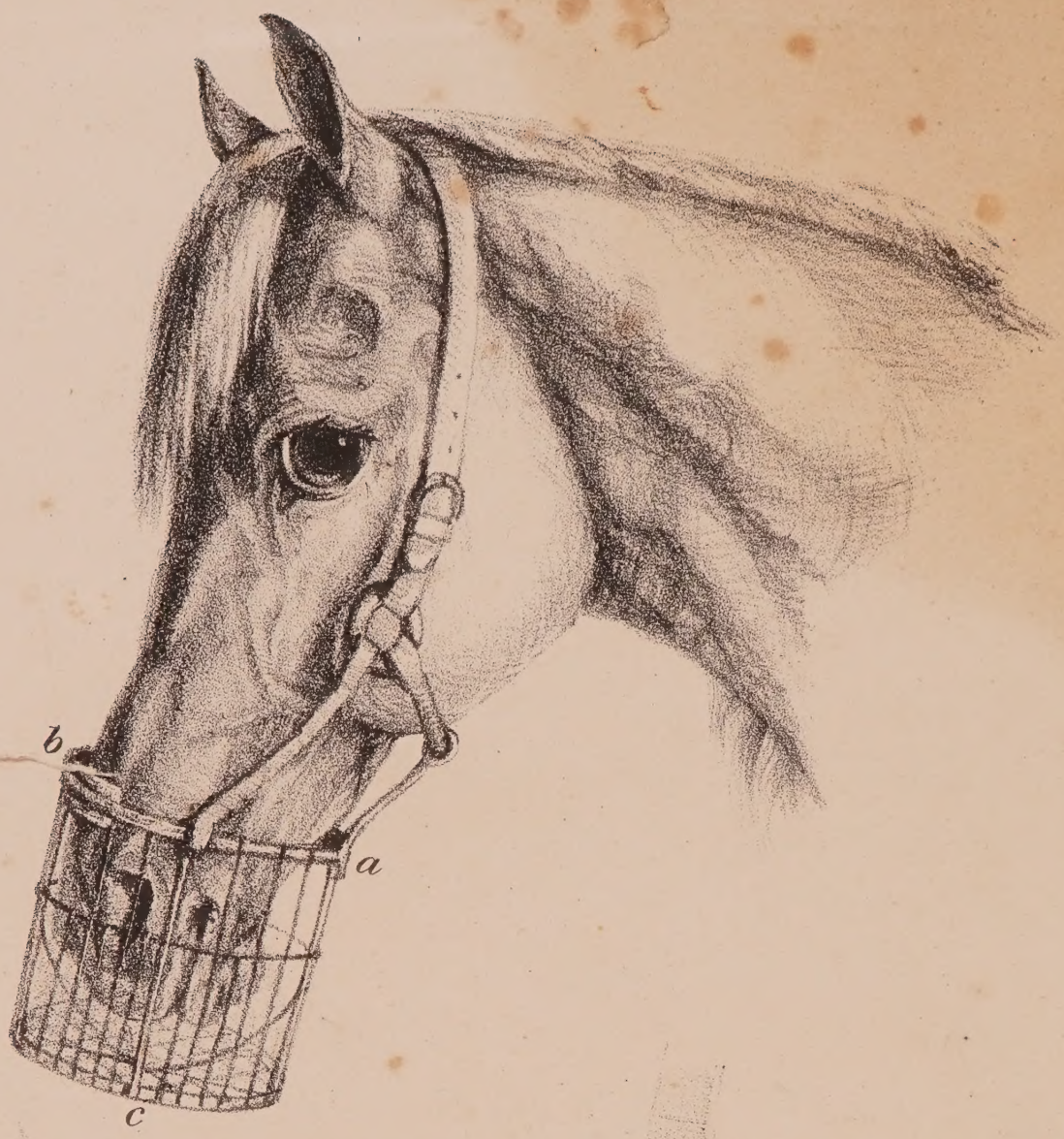
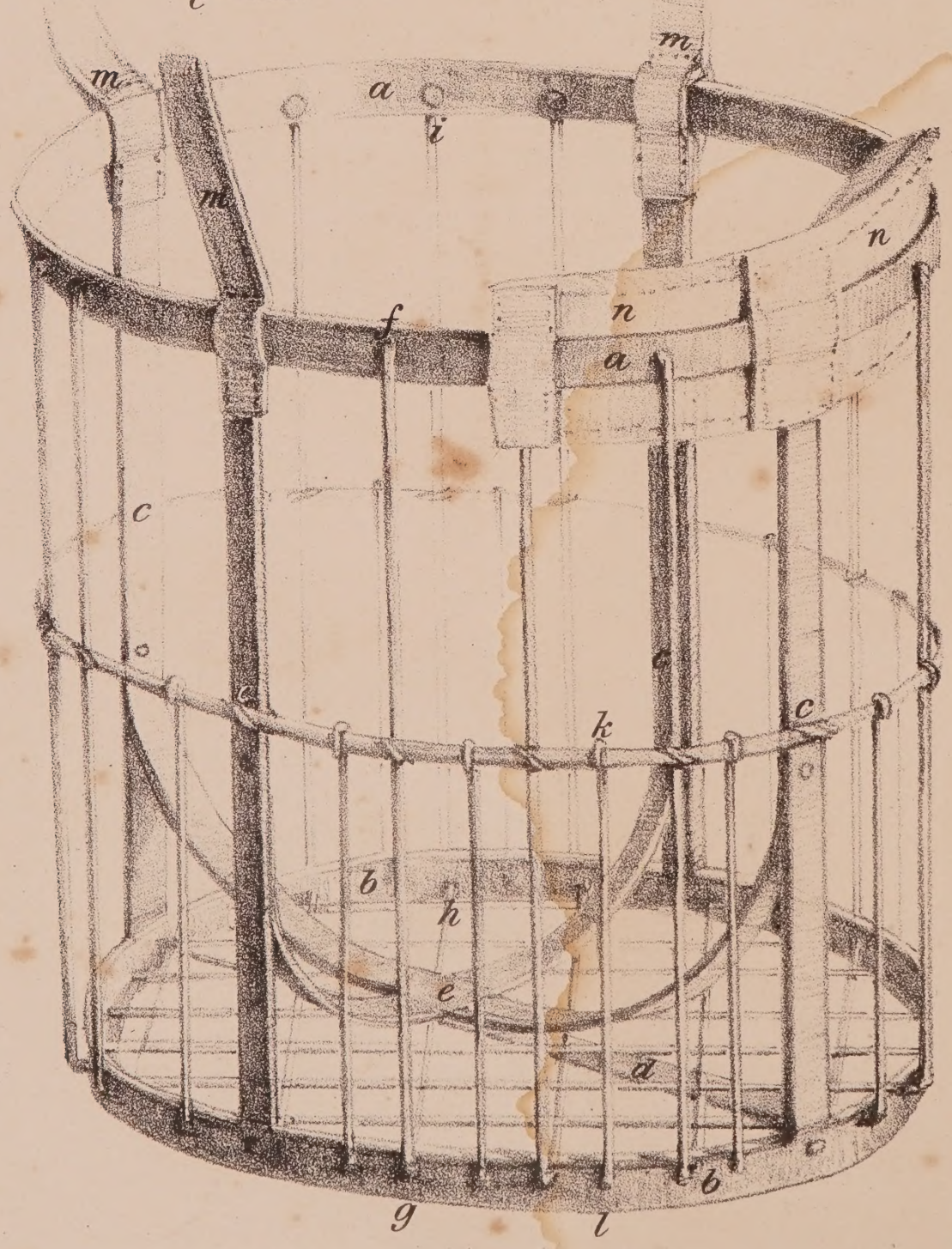


Fig. 2.



On Stone by W. Miles Esq.r

Printed by C. Rusdon Exeter.

Plate IX.

Represents the muzzle mentioned at page 50.

Fig. 1.—Shows it in its position upon the horse's head.

a b. Mark the width of the opening—which should be determined by the distance from the nose to the jaw bone, at about two or three inches above the angle of the mouth. It is not necessary that the head should go deeper into it than this, but it is *essential* that the bottom of the muzzle should hang fully three inches below the lips, as shewn at *c*, because the horse is thus obliged fairly to deposit the muzzle before he can be able to reach the bottom of it with his lips; in doing which the weight of the muzzle, and the pressure thus made upon it, will effectually flatten the straw out of his reach, and by disappointing his hopes, soon cause him to discontinue his fruitless efforts. But if the bottom of the muzzle be brought tight up against the lips, the head and the muzzle will act together, and the horse will eat just as much of his bed as he pleases. Its whole utility depends upon the horse's nose being so free of the muzzle, that he shall not be able to reach any part of it with his lips, without *putting it down*, when he instantly defeats his object.

Fig. 2.—Shows the detail of the muzzle.

a a. The upper rim made of iron.

b b. The lower rim made of iron.

c c c c. Four iron uprights connecting the upper and lower rims and rivetted to them.

d. An iron stay running across the bottom from front to rear.

e. A cross piece of iron rivetted at the centre at *d:* the arms curving upwards are each rivetted to one of the uprights, *c*, by which much additional strength is obtained, and the difficulty of feeding through the open spaces greatly increased.

f. Shows one of the long wires coming through the upper rim, whence it passes straight down to *g*, through the lower rim, across the bottom to *h*, where it again passes through the lower rim on the opposite side, and is carried up to the upper rim; and is rivetted through it at *i*. It is tied to the centre band of wire where it crosses it on either side.

This description applies to each of the long wires, as does the following to the short ones.

k. Shows one of the short wires commencing with a turn round the centre band of wire, and descending to the lower rim, through which it passes to be rivetted on the inner side.

m. Portions of the head stall with the mode of fastening them to the muzzle.

n n. A pad to protect the horse's nose from the rim of the muzzle. It should be hollowed in the centre so as to prevent the weight resting entirely upon the bone.

It has been suggested to me that a similar pad at the back part, to protect the jawbone, would be an improvement.

The frame work should be formed of flat iron, three-eights of an inch wide, and one-sixteenth of an inch thick; and the wire—tinned iron the size known as No. 11.

Fig. 1.

Fig. 2.

Fig. 3.

On Stone by W. Miles Esq.r

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Plate X.

I have been induced to add this Plate in consequence of meeting with the foot represented in Fig. 1 ; although the greater part of the work being in type must prevent my referring to it in its proper place in the body of the book. It presents such an admirable illustration of the effect of shoeing and stabling upon the frog and elastic cushion, that I could not resist the impulse to draw it and place it by the side of the young foot, already represented in Plate 2—and having done so, I was further led to add a sketch of the interior of the hoof, in the hope that bringing the three figures under notice at one view, might enable me to point out more clearly what changes have taken place, and how they have been brought about. Upon a careful comparison of Fig. 1—with Fig. 2, we shall be struck among other things with the great difference observable in the bulk of the elastic cushion or fatty frog in the two feet—both in the heel at *b*, and in the portion immediately between the navicular joint and the horny frog at *e*.—I found however a difference in the *quality* or texture of this part in the two feet of far greater importance than any diminution of *quantity*,—for while Fig. 2 presented a substance resembling throughout its whole extent a mixture of fat and tendon—and yielded to pressure from the point of a knife without being pierced by it—that is sunk away before it, the corresponding part in Fig. 1, was of a close unyielding texture, offering the resistance of firm gristle, and, instead of sinking away from the point of the knife, resisted it with a grating sound : indeed I could perceive no difference between the sound produced by passing the point of the knife over this substance and over the horny frog.—I have attempted to mark where the change of structure commences by a variation in the touch upon the stone,

by which it will be seen that the *texture* of the substance at *b* is pretty much the same in each foot, notwithstanding the great disproportion between their respective *quantities*.—In Fig. 1, where it has suffered under bad treatment, and is wasted and dwindled to almost nothing, it soon assumes a close firm texture as it descends from *b* towards *e*—until (all its soft parts having been absorbed) it terminates in the hard mass marked in the Plate by chequered lines.

If we now turn to Fig. 3—and with its assistance contemplate this part in its situation in the hoof, we shall obtain a clear idea of the relation it bears to the other parts of the foot in general, and the navicular joint in particular.

a. Is a broad flat mass of horn, projecting upwards into the middle of the elastic cushion, and is called the "frog stay."

b b. Are two horny projections rising into the cavity of the hoof formed by the commissures.—They each at *b*, support the part marked *b* in Fig. 1 and 2.

c c. Are portions of the same projections, and are situated just under the two ends of the navicular bone, and mark the point on either side where diminution in the natural elasticity of the fatty frog would be felt with the greatest severity by the navicular joint: for under the most favourable circumstances, the quantity of cushion between these points and the navicular joint cannot be very large; and hence the importance of our doing all we can to preserve its elasticity as long as possible.

Fig. 1 and 2,—being sections of the foot, are calculated to impart a false idea of the extent of protection afforded to the navicular joint by the elastic cushion, if they are not considered in conjunction with Fig. 3, for the cushion, being cut through at the part occupying the hollow between *c c.* and *d*,—which is its deepest part, would lead to the conclusion that the same

quantity of protection was extended to the whole of the joint, if we did not observe that the projections of the commissures *cc*, Fig. 3, lie nearly on a level with the top of the frog stay, *a*, showing that there is not space for an equal quantity of cushion between them and the navicular joint, as there is between the navicular joint and the bottom of the hollow at *d*;—and it is evident, that if the cushion at these places be not kept in a sufficiently elastic condition to guard the delicate membranes of this important joint from the consequences of being compressed between the navicular bone and these horny projections, injury to the joint must ensue, and unsoundness of the foot become inevitable.

Having seen the changes that have occurred to the fatty frog of Fig. 1, we shall naturally be led to inquire if the sensitive frog has fared any better; to which end we must first examine it in Fig. 2, where we shall find it distinctly marked at *g*, and by tracing it over the frog stay, *a*, we shall see that it extends over the whole surface of the horny frog, between it and the fatty frog;—but we shall in vain look for it in Fig. 1;—the constantly increasing compression it has received, between the gradually hardening cushion, and the horny frog, has by degrees so effectually caused its absorption, that not a vestige of it remains—as is shown by *g*, Fig. 1.

The diminution that has taken place in the horny frog of Fig. 1 will be made sufficiently evident by a comparison of the parts marked *d* and *f*, with the same parts in Fig. 2.

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2

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